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Foundrymen Discuss Many Problems at Chicago

Report of the Annual Meetings of the Three Great Allied Organizations— Scientific Management, Costs and Efficiency in Casting Production Considered

Comprehensive, interesting and instructive discussions followed the reading of nearly every paper presented at the Chicago convention of the American Foundrymen's Association, at the LaSalle hotel last week. The character of the proceedings, therefore, were of the utmost helpfulness to those in attendance and their permanent value will undoubtedly be greatly enhanced through the contributions made on the floor. The spirit of the meeting clearly indicated a great desire on the part of foundrymen everywhere to profit through the interchange of information and a willingness to co-operate to the utmost for the general good of all. The papers and discussions also delineated the most important technical problems confronting the manufacturers of castings at present and prompted their solution.

Among these problems are those of cost keeping systems for all classes of foundries and standard practice in steel casting shops. These two questions will be the object of searching study during the coming year by special committees representing the American Foundrymen's Association. The personnel of the committees will be carefully chosen in order that they may command the utmost skill and experience. The committee work of the society is growing in volume and importance year by year and it is the policy of the organization to further strengthen its efforts along this line.

Excellent facilities for conducting the professional sessions were afforded in the magnificent ball room of the LaSalle hotel and the large registration from all sections of the country reflected the constantly growing interest in problems relating to foundry practice. The Chicago committee provided an interesting series of entertainments for the members and their guests and in many ways added to the enjoyment of the occasion.

ALFRED E. HOWELL

Recognition Was Given to the Foundry Industry of the South by His Election as Chief Executive of the American Foundrymen's Association.

Opening Session

At the joint session on Tuesday morning, the visiting foundrymen were greeted with appropriate words of welcome by Chas. A. Plamondon, chairman of the Chicago committee; Wm. H. Sexton, corporation counsel for the city of Chicago; E. C. Ferguson, of the Association of Commerce, and O. J. Abell, for the entertainment committee. Alfred E. Howell, senior vice president of the American Foundrymen's Association, replied to the address of welcome. In a pleasing and humorous manner he touched on the early history of Illinois and the great commercial growth of Chicago.

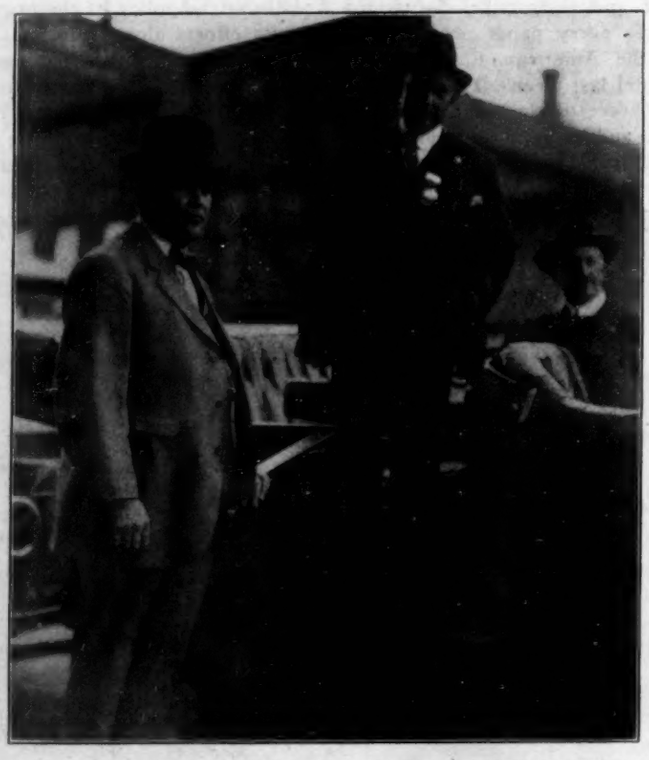
In his annual address, H. D. Miles, president of the American Foundrymen's Association, discussed

many important subjects. He pointed out the advantages of holding the annual conventions each year in a different city thus giving the foundrymen an opportunity to observe and compare shop operations in different parts of the country. Feeling that in many cases the executives of various foundry companies do not reap much benefit from the proceedings and work of the association, on account of lack of time, Mr. Miles recommended that each company delegate to a suitable employe the duty of attending the conventions and studying the proceedings for the purpose of making recommendations from the information so gained. He pointed out that the association aims to be of direct commercial benefit to its members.

Mr. Miles strongly recommended a continuance of the work of the committee on standard foundry costs for the purpose of investigating this vital subject thoroughly and providing an up-to-date, comprehensive cost system. The vital necessity for work of this character was painted in compelling phrases. The foundrymen of the United States, in the opinion of Mr. Miles, face the industrial changes which will result from the new tariff policy of the government with courage and assurance that no permanent ill effects will result.

In his thirteenth annual report, Dr. Richard Moldenke secretary of the American Foundrymen's Association, emphasized the suggestions of Mr. Miles in regard to the work of the committee on standard cost accounting. Dr. Moldenke stated that a new report from this committee which would include the details of a new foundry cost system would be ready in the course of a few weeks. He also commented on the great advances in cupola practice during the past year and on the growth of sentiment in regard to the prevention of industrial accidents. In commenting on the tariff, the secretary's report states that the new schedule of duties will make it necessary for the American foundrymen and manufacturers in general to pare down their cost of operation to an absolute minimum. In many lines of endeavor, it was stated, the country does not realize how wasteful its industrial operations have been. Hereafter the shops of members of the association will be opened only to those foreign visitors who are willing to grant reciprocal courtesies. This action was taken because certain European companies, whose officers have been received in American plants, had refused admission to their own works to members of the association traveling abroad. The secretary condemned this attitude on the part of some foreign manufacturers in unmeasured terms, characterizing it as "industrial piracy". The report showed that there are now 756 members in the association.

W. M. Corse, secretary-treasurer of the American Institute of Metals, in his annual report, pointed out the value of the co-operative work which has been done during the past year with the United States bureau of standards and bureau of mines. The institute has worked with the bureau of mines in testing the various types of furnaces designed for melting nonferrous metals and at the same time has co-operated with the bureau of standards in standardizing test bars made from brass, aluminum and other alloys.



R. S. BUCH, H. R. ATWATER AND J. S. McCORMICK ARRIVING FOR AN OFFICIAL INSPECTION OF THE EXHIBITION

The report of the A. F. A. committee on industrial education presented at the Tuesday morning session covered the progress of the year in this important line of endeavor. Some portions of this report are as follows:

There is an increasing sentiment among the authorities in charge of technical and industrial schools in favor of adding foundries to their school equipment. While, from the standpoint of the practical needs of the foundry industry, these school foundries are of little immediate help, nevertheless, the movement is gratifying and helpful as a recognition of the value of the industry. However, whatever the willingness of the school authorities may be, there is no prospect at present for the establishment of special preparatory schools for the foundry.

There is a growing disposition by municipalities to establish continuation schools, part-time schools, technical high schools or industrial departments in academic high schools, according to the needs of the locality. As a counterpart to this disposition toward general preparatory industrial schools by municipalities, there is a growing tendency on the part of railway companies and manufacturers to establish shop schools, that is apprentice schools of their own. There are at present 71 of such schools in successful operation.

There is a movement on foot now to create a system of vocational schools, separate and distinct from the existing organized system of public schools, leaving the public school to follow in the wake of the industrial school if it will, but making no particular attempt to benefit from the traditional educational system. The cause of this movement is the almost universal unsympathetic attitude of the school people toward industrial education, and the fear that as manual training has been emasculated and has been made part of the academic school system, to the disadvantage of industries, so likewise would industrial courses be soon emasculated and become part of the academic school system dominated over by the academic teacher.

While this condition exists, the foundries have an opportunity to do something themselves to relieve the situation. The problem is not so much to get boys with a specific trade training, because boys who have passed through schools where such training is given will not stay permanently as molders in foundries, but to get boys with some degree of developed general intelligence, or to develop that intelligence while they are at work. Conditions are more favorable now to do this with the co-operation of the schools, than they were last year or the year before. States, municipalities and the school people are more ready to help the industries than they were formerly.

The first step is to put the foundries and work shops in as good sanitary and clean condition as is possible and insist upon them being kept so. Hygienic, charitable, child-labor and similar congresses are continually educating the people up to the necessity of healthy surroundings and at the same

time proving, in one way or another, how the physical efficiency and therefore the productive capacity of the worker in shop, store and office is increased. Foundrymen should insist upon the beginning of a preparation in the seventh and eighth grade for industrial life. The school people are much more willing to listen to such a proposition now than formerly and differentiation of courses in the seventh and eighth grades to meet the demands of industrial life has been frequently discussed lately in teachers' conventions. It is admitted that such a change would hold many who now drop out at 14 years with a sixth and seventh grade education only.

At the joint session on Tuesday afternoon, M. W. Alexander, of the General Electric Co., Lynn, Mass., gave an interesting address, illustrated with lantern slides, on the "Apprenticeship System in the Metal Industries. He referred particularly to trade apprentices and pointed out the vital necessity for providing better systems for the development of skilled workmen. In some detail he outlined the methods employed by the General Electric Co. in this work. Mr. Alexander's address was an illuminating sidelight on the problems surrounding the proper training of shop apprentices as outlined in the report of the committee on industrial education quoted above.

C. E. Knoeppel, New York, in an address following Mr. Alexander, pointed out how to proceed to make a time study. In his opening paragraphs, Mr. Knoeppel cited instances to show where careful time studies, coupled with an application of efficiency principles, had effected great reduction in molding costs. In one case the cost of molding pommels for pack saddles was reduced from $1.17 to $0.54, while the earnings of the molder increased from $3.28 to $5.74 per day. In another case, the time required to make the mold for a large steel casting was reduced 32½ per cent; the cost of doing the work was cut 30 per cent; the production of the shop increased 60 per cent, and the earnings of the molders increased 12 per cent. He then took up the details of his subject, discussing the elements to be considered in making a time study, the variables of the men and the work, the tools needed, the classes of studies, the determination of fair standards, the separation of inefficiency, the making of more than one study at a time, correcting for errors and the practical uses of time study data.

A valuable discussion of the effect of silicon on the characteristics of gray iron castings and the relative merits of charcoal and coke pig iron was precipitated by a paper entitled "Gray Iron for Motor Car Castings", by H. B. Swan, of the Cadillac Motor Car Co., Detroit.

The discussion tended to the opinion that for intricate work, such as motor car cylinders, charcoal pig iron was preferable because good castings could be made with a minimum of silicon. It was pointed out also that the scrap available in this country contains more sulphur every year; not long ago, said Dr. Moldenke, the average amount of sulphur in foundry scrap was 0.06 per cent and now it is 0.12 per cent. The tendency of excessive amounts of silicon, over 2 per cent, to make gray iron castings gritty and very difficult to machine was commented on by several speakers, but it was made plain that much more care and skill in managing the cupola are necessary to make good castings with low silicon than with strong, high silicon pig.

MAJOR JOSEPH T. SPEER AND J. S. SEAMAN ARRIVED AT THE EXHIBITION HALL IN STATE

"Some Difficulties in Pouring Steel Castings", by R. A. Bull, of the Commonwealth Steel Co., Granite City, Ill., contained many interesting paragraphs, some of which are quoted herewith:

In making up the stopper rod, great care should be taken in the use of keys for securing the stopper-head. It is false economy to use a key more than once. A crystallized key may cause a heavy loss and the cost of a new one is negligible. The joints between the sleeves of the stopper-rod, as well as those between the bricks of the ladle lining itself, should be carefully looked after. Sleeves, stopper-head and nozzle should be selected with great care, to see that none is cracked or patched, and that the contour of the nozzle enables the stopper head to have a perfect seat. The black ring left by rubbing a graphite stopper head around a clay nozzle is proof of fit.

Having made up the rod, the clay joints should be well dried, like the clay lining of the ladle bricks. And in drying the ladle itself many believe an upright position to be preferable. Undoubtedly the brick lining is thus susceptible to displacement. Perfect lining would sometimes prevent those red spots which suddenly appear on the ladle plates, which are immediately followed by the melting of the latter and a very awkward breaking out of the metal. The nozzle must be carefully set and well rammed in, and the lower portion should extend below the nozzle-plate sufficiently to enable the metal to clear the plate nicely and not become gummed at the outlet.

The setting of the stopper rod calls for nice adjustment under somewhat unpleasant conditions, and for this a careful, painstaking man is essential. This work I believe can best be done under the direction of the melter so there can be no division of responsibility. The mysteries of ladle leaks and consequent difficulty in fixing responsibility for bad spills, are quite sufficient at best without adding to the difficulties by inviting controversies, which sometimes prevent unbiased analysis of causes.

In tapping the heat, the additions should be of moderate size to enable reasonably quick melting and thorough distribution. Large lumps of ferromanganese, gravitating to the nozzle, may stick to the lip of the latter in a half melted condition, and cause a very bad shut-off. The melter should personally look after the size of the lumps constituting the additions, and the introduction of these into the ladle, which should be regulated by the nature of the tap.

Given a perfect heat and a perfect ladle, there should of course be a clean shut-off. But this is by no means always the case. The ladle

man or steel pourer may inadvertently open up too strongly on his first flask. Then if this initial mold is moderately small so as to fill quickly, the man whose hand operates the lever may have hot work cut out for him for a period. The steel pouring over the lip of the nozzle without any check from adjacent position of the stopper head may seem determined to flow regardless of the movement of the lever. This is due to chilled steel adhering to the nozzle, preventing a perfect seat, and caused by a tempestuous flow of hot metal in excessive quantity over a comparatively cold nozzle. A restricted flow, giving time for such a skull to melt away if it forms, is highly desirable on the first mold. Sometimes the stopper head may stick to the nozzle at the start and excessive pressure must be exert-

GEORGE R. RAYNER, OF THE CARBORUNDUM CO.

ed on the lever with the result that the stream may be open in greater volume than intended, through the sudden release.

A prolific source of leaks is cold metal, which encourages the formation of skulls around the top of the nozzle. This cause is, of course, one easily determined and may give very serious trouble during the early pouring. On the other hand, I have heard some foundrymen attribute bad leaks to the temperature of the steel being too hot. I have never felt satisfied with such an explanation, believing that the temperatures attained in the open-hearth furnace in regular practice are not sufficient to cause a leaky stopper, given a perfect ladle, with all that implies. Unquestionably, the impact of the stopper head on the nozzle, with both in a highly heated state, will make them wear down. But if they are of good material and perfectly sound, such wear, as I believe, will be uniform.

Supply of Stoppers and Nozzles

The difficulty of obtaining a supply of satisfactory nozzles and stoppers for bottom-pour steel ladles was tellingly portrayed by John Ploehn, of French & Hecht, Davenport, Ia. During the summer, Mr. Ploehn visited the principal manufacturers of refractory brick and found that there are six different nozzle designs in general use for ingot pouring and many more for steel foundry work. The steel foundry nozzles vary from 1 to 2½ inches in diameter of bore, with about 14 different styles for each size. In many cases the variations are only slight. On account of this great range in sizes and designs, the refractory manufacturers are able to make nozzles only in small quantities, causing dissatisfaction both to the producer and consumer. As a result of Mr. Bull's paper and Mr. Ploehn's discussion, a motion was passed to appoint a committee on steel casting shop practice empowered to develop a standard design for ladle nozzles and stoppers and report at the 1914 convention. It is felt that this and other standardizations would be of great service to the steel foundrymen.

Albert Hiorth read a paper giving the details of his electric induction furnace and facts regarding its operation in the manufacture of steel. F. T. Snyder, of the Metallurgic Engineering Co., Chicago, discussed electric steel castings and read figures showing a cost of electric steel made under foundry conditions of from $18.30 to $26.14 per ton. This covers cost of melted metal in the ladle.

Several other papers read by title only at the Wednesday morning session are as follows: "The Pattern Shop as Related to the Steel Foundry", by E. R. Swanson, Commonwealth Steel Co., Granite City, Ill.; "Some Observations on Miniature or Detachable Open-hearth Furnaces", by W. M. Carr, Erie, Pa.; "Changing the Composition of Malleable Cast Iron", by P. Rodigin, Berdiansk, Russia; "A Study of the Annealing Process for Malleable Castings", by E. L. Leasman, Boscobel, Wis., and "Malleable Troubles", by Richard Moldenke.

Gray Iron Foundry Practice

The problems of the gray iron foundry were discussed in a group of papers covering cast iron specifications core testing, automobile cylinder work, molding sand tests and general suggestions regarding jobbing foundry operation.

The need for standard specifications for cast iron was pointed out in a paper by R. S. MacPherran, West Allis, Wis., which follows in part:

There are specifications calling for test bars 1¼ x 12 inches round; 1 x 2 x 24 inches; 1 x 1 x 12 inches; 1 x 1 x 4 feet, 6 inches; 1 x 1 x 4 feet, 8 inches, etc. Sometimes the bars are to be corrected to some definite sized bar, and sometimes to some unfamiliar quality factor. Some specifications call for transverse bars only, some for tensile only, and some for both.

The minimum breaking load for 1 x 2 x 24-inch transverse bars varies from

R. A. BULL, ONE OF THE STEEL CASTING EXPERTS IN ATTENDANCE.

1,700 to 2,500 pounds, and the tensile strength per square inch from 18,500 to 25,000 pounds. One specification calls for a tensile strength of 18,500 pounds with an "allowable variation of 5 per cent either way". These different requirements on the part of engineers only serve to confuse the manufacturer. In the writer's opinion, much should be left to the judgment and experience of the latter.

In a shop where a certain kind of castings are a part of the regular output, the shop practice in making them is based on actual experience both in manufacture and in service. A purchaser calling for changes from this shop practice should do so only after careful consideration of the situation

and for some definite reason. It is too often the case that a specification is copied from some handbook and inserted bodily in a contract without regard to the class of material it is to cover. In one case in the writer's experience the specification for suction piping called for a breaking load of 2,200 pounds on a transverse bar 1 x 2 inches x 24 inches between supports. The same specification called for a tensile strength of 20,000 pounds per square inch on bars cast to represent the steam cylinders. During the manufacture of this engine, a set of transverse bars broke below 2,200 pounds and caused the rejection of a suction pipe. The tensile bars from the same iron broke above 20,000 pounds per square inch, which would have passed a high pressure steam cylinder. We have here the anomaly of a material satisfactory for steam cylinders, but causing the rejection of a suction pipe.

Tests For Cast Iron

In the discussion following this paper there was some controversy regarding the relative advantages of tensile and transverse tests for cast iron, but the consensus of opinion was strongly in favor of the transverse bar on account of simplicity and economy. Transverse tests are easily made and the apparatus required is much less expensive than that necessary for tensile tests. Also the transverse test is more sensitive to the slight elasticity of cast iron.

The following paragraph summarizes the contents of a paper on "Automobile Cylinder Founding", by Robert Crawford, of the Atlas Foundry Co., Detroit:

The unfortunate situation in the automobile industry is that the purchasing agent looks for cheap castings, and the foundryman simply has to use a lot of scrap of which he knows little or nothing. The result is a wailing in the machine shop which is not good to hear. Those who know will not be bluffed into this way of doing business. They will use the best of materials and charge their price. Not only has the temptation to quote a low price and then make up by using cheap scrap caused much disaster, but the advent of the automobile engineer has given us 5/32 inch and 3/16 inch water jackets, where 7/32 inch and ¼ inch had been the rule. The great strain from vibration and the gas explosions on the cylinders, pistons and rings has proven conclusively that it is wise to start with a good foundation in the way of raw materials, and then to melt them right.

"With ordinary mixtures," said H. M. Lane, in a paper on core testing, "it takes from eight to ten times as heavy a load to break a core in tension as it would had the core been made 1 inch square and tested transversely on centers 1 foot apart. Small flaws that might make but a small difference in the transverse work, will show up big in tensile tests. Also it is much easier to make small briquette shaped cores for the tensile tests than it is to make long cores and have them perfect throughout the entire length." Mr. Lane's paper also contained considerable detailed information on making core tests and was accompanied by illustrations of the apparatus necessary for this work.

E. A. Johnson, of Boston, Mass., pointed out some of the practical aspects of molding sand testing along the lines developed by the American Foundrymen's Association.

"Put Your House in Order", a paper by Fred A. Parkhurst, Detroit, was

PHILIP MUELLER AND T. H. SCHUTZ, OF THE MUELLER MFG. CO.

an appeal for a more thorough study of the principles of scientific management by foundrymen. This paper was supplemented by a contribution on "Common Sense Foundry Cost Systems", by E. W. Riker, New York. Mr. Riker has developed a simple cost system based on weekly reports. The reports can be prepared without serious effort from data furnished by standard forms. Portions of this paper are as follows:

A cost system is rightly called the mainspring of the business, but it must be practical; and when installed it ought to be clearly understood that such a system is not automatic and that its value depends largely on the understanding the chief executive of the business has of its principles and its possibilities. The foundry cost system that is right and fits the foundry into which it is installed should not require special accountants to operate it, but just the ordinary foundry clerk who is practical by reason of his foundry education and experience and is, therefore, helpful to the foundry owner or executive because he will be practical and logical in his work and have his cost figures in such shape that they will give the exact facts when needed. This feature is mentioned here to convey to you the thought that if a foundry cost system is based upon the right principles and is appropriate to the foundry in which it is installed it can be operated economically. Therefore, accurate cost control of a foundry by economical methods is possible beyond the question of a doubt. A foundry cost system can readily be devised to fit the foundry for which it is intended that will absorb and account for every disbursement for material and labor, whether it is a direct or productive item or an indirect or non-productive charge. Furthermore, these disbursements may be separated to divisions or departments for efficiency in foundry management and still further be divided to classes of castings or to individual jobs or orders, to show complete cost of product by classes, by jobs, or by specific orders. All of this can just as well be tabulated and presented weekly, instead of monthly as is done in some foundries, and in a manner that is accurate, simple and economical.

The Thursday morning meeting concluded with an illustrated address by C. B. Connelley, dean of the Carnegie Institute of Technology, Pittsburgh. Mr. Connelley described the equipment, aims and policy of the Carnegie Institute in a detailed and interesting manner. Thos. D. West, of Cleveland, presented a brief paper recommending the adoption of a series of standard forms for reporting foundry accidents.

Simple methods of testing and analyzing foundry flour to determine its value as a core binder formed the subject of an interesting paper by G. S. Evans, Lenoir City, Tenn. Of the various constituents of value, starch and gluten are the only ones possessing any marked power of adhesion. Of the two, gluten is by far the most valuable. The Lenoir Car Works, with which Mr. Evans is connected, buys all of its foundry flour according to the following specifications:

The material desired is starchy wheat flour, free from all adulterants either vegetable or mineral, and must conform to the following requirements:

1. Physical properties should show a smooth surface, free from any appreciable amount of visible bran particles, when slicked-out with a smooth paddle or spatula and examined with the naked eye at a distance of 15 inches from the slicked surface. Must be free from musty odors.

2. Chemical composition—

	Per cent.
Mineral matter or ash must not exceed	1.35
Crude fat or ether extract must not exceed	2.50
Crude fiber must not exceed	1.25

3. Each car load shall be considered a unit. Samples of one pound each will be taken from each 5,000 pounds of the shipment, the samples added together and thoroughly mixed and the resultant sample represent the shipment.

4. The chemical composition will be determined according to standard methods, and should the sample fail to meet the above requirements, the shipment will be rejected.

5. All rejected material will be held subject to shipper's disposition and the shipper shall assume all charges on rejected material.

6. All shipment to be made in jute bags unless otherwise specified.

Dr. Richard Moldenke, in a memorandum on centrifugal blowers for foundry use, gave the results of an efficiency test of a Rateau type blower built in Germany. These tests show an efficiency ranging from 73 per cent at 2 inches water pressure to 77 per cent at 5.2 inches water pressure.

Use of Powdered Coal

Facts of considerable interest to iron and steel engineers were contained in an illustrated paper on the use of powdered coal as a fuel by W. S. Quigley, of the Quigley Furnace & Foundry Co., Springfield, Mass. This paper follows in part:

Today powdered coal is used in iron and steel plants for puddling, busheling, reheating, rod heating, upsetting, etc. For best results powdered coal must contain not over ½ per cent moisture and be ground so that 93 to 95 per cent will pass a 100-mesh sieve and 80 to 85 per cent a 200-mesh sieve. In that state the particles are so finely divided that each one, in a proper burning apparatus, is surrounded by the necessary amount of air for combustion and thereby liberates the entire fuel energy of the coal at once.

In a plant for properly preparing and burning powdered coal, a milling building from which the coal can be delivered to a crusher and reduced to the size required for pulverizing is necessary. From the crusher, the fuel must be elevated to a crushed coal storage bin, transferred from thence to a dryer and pulverizer and then delivered to distributing conveyors which supply the individual hoppers located near the furnace. The coal must be fed to the burners steadily and under absolute control.

The controller or device which regulates the coal feed to the burners is to the powdered coal furnace what the carburetor is to the gasoline engine. It is fastened to the bottom of a specially designed hopper or bin and consists of two screw conveyors. The upper one propels the coal forward to a point where it falls in a steady stream past the opening through which it is forced to the burner by a jet of low pressure air, the excess coal falling to the lower screw of greater pitch, which returns the overflow back to the base of the hopper. The controller screws are operated by either chain drive or are direct connected to variable or constant speed motors.

In a four-door forge furnace having a chamber about 6 feet wide and 1 foot long used for heating engine frames, etc., in the hammer shop of the American Locomotive Co., the fuel consumption, hand-fired with bituminous coal, was 650 pounds per hour. With powdered coal it consumes 350 pounds per hour and heats 20 per cent faster.

A report from the Lima Locomotive Works, Lima, O., shows that a large furnace having a chamber 7 feet 2 inches by 15 feet 3 inches started cold at 8:15 a. m., reached a temperature of 2,200 degrees Fahr. at 9:15 a. m., and 2,500 degress at 9:45 a. m., which compares favorably with oil or gas practice. The coal used is bituminous run of mine, 34.70 per cent volatile, with a heating value of 14,000 B. T. U. per pound. It costs $2.25, delivered at Lima, allowing 50 cents per ton for cost of pulverizing and distributing.

Allowing 80 per cent efficiency and 50 cents per ton for the cost of gasifying a ton of coal, the comparison between oil, producer gas and powdered coal, based on cost of fuel in Lima, O., would be: Fuel oil, 28,600 B. T. U. for 1 cent, producer gas, 91,228 B. T. U. for 1 cent, and powdered coal, 114,036 for 1 cent. At the plant of the American Iron & Steel Co., using powdered coal, records as low as 1,083 pounds per ton have been made, while a fair average fuel consumption is 1,185 pounds of coal per gross ton of muck bar.

W. S. Hoyt, of the Oxweld Acetylene Co., Chicago, gave a lecture on oxy-acetylene welding and cutting, which was illustrated by numerous lantern slides. An article on this process as applied to foundry work will be published in an early issue of The Iron Trade Review.

The annual election of the American Foundrymen's Association resulted in a unanimous choice of Alfred E. Howell as president for the ensuing year. Mr. Howell, who is associated with the Phillips & Buttorf Mfg. Co., Nashville, Tenn., served during the year as senior vice president. Dr. Richard Moldenke was re-elected secretary-treasurer by acclamation. Eight vice presidents were also chosen. They include: R. A. Bull, Commonwealth Steel Co., Granite City, Ill.; H. A. Carpenter, General Fire Extinguisher Co., Providence, R. I.; S. B. Chadsey, Massey-Harris Co., Toronto; G. R. Lombard, Lombard Iron Works & Supply Co., Augusta, Ga.; T. L. Richmond, Buffalo Scale Co., Buffalo, N. Y.; T. W. Sheriff, Sheriff Mfg. Co., Milwaukee, Wis.; J. J. Wilson, Cadillac Motor Car Foundry, Detroit, and Walter Wood, of R. D. Wood & Co., Philadelphia.

Before turning over his office to Mr. Howell, President Miles announced the following committees:

Papers.—Jos. J. Wilson, Detroit, Mich., chairman; L. L. Anthes, Toronto; H. M. Lane, Detroit; Thos. D. West, Cleveland; A. O. Backert, Cleveland; R. A. Bull, St. Louis; H. B. Swan, Detroit; H. A. Carpenter, Providence, R. I., and H. E. Field, Pittsburgh.

Standard Foundry Costs.—H. D. Miles, Buffalo, chairman; the remainder of the committee to be appointed later.

Standard Steel Foundry Practice.—Dudley Shoemaker, American Steel Foundries, Indiana Harbor, Ind., chairman; A. H. Janssen, Davenport, Ia.; John Ploehn, French & Hecht, Davenport, Ia.; Thos. D. West Jr., Cleveland; L. A. Way, Corapolis, Pa.; A. H. Thomas, Columbus, O., and R. A. Bull.

The usual vote of thanks were extended to the Chicago committee for its entertainment and to the authors of papers read during the convention. The place for the next convention was left to be settled by the incoming executive committee, although it is probable that the meeting will be held in Boston next June. The association definitely committed itself to a return to the spring meetings.

The convention concluded with the presentation of a handsome wrought silver pitcher to J. S. Seaman, the oldest living past president of the American Foundrymen's Association. The presentation address was made by Mr. Howell. Mr. Seaman replied with a few words that deeply moved every one present at the ceremony. He stated that he would make suitable arrangements so that the pitcher would always remain in the possession of the oldest living past president of the association.

Institute of Metals

At the three sessions held by the American Institute of Metals, several reports were presented on the work that is being done by the Bureau of Standards, co-operating with a committee of this society. Of far-reaching importance will be the ultimate adoption of standard nomenclature of non-ferrous alloys and the work already done was summarized in a report presented by C. P. Karr, associate physicist of the Bureau of Standards. The designation of alloys today is in a chaotic state, many bearing the names of their inventors which in no way indicate their composition. To a large extent, the secrecy which has prevailed in the non-ferrous casting trade is accountable for this situation, and the adoption of a simple method of designating the various mixtures whereby their contents at least may be approximated from the term applied to them is very much sought by the brass foundry trade.

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View of dock from shore, showing steel approach

Handling Ore from the Cuyuna Range

The main line of the Northern Pacific railroad between the head of the lakes and the Pacific coast passes through the axis of the Cuyuna range. It is only natural, therefore, that the Northern Pacific should eventually become an important carrier of Cuyuna range ores. To take care of its share of the traffic in this rapidly growing district, a new steel and concrete dock has been built by the Northern Pacific at Allouez Bay, Wis., and several spur lines have been constructed into the most promising portions of the Cuyuna range. The spur lines radiate from Deerwood, Minn., situated approximately at the geographical center of the ore district.

The general arrangement of the dock is shown in Fig. 4. It has 102 ore pockets with a capacity of seven cars each. The total storage capacity is about 35,000 tons. The pockets are larger than those in any other of the existing ore docks on the great lakes. The pocket floors are reinforced concrete with a slope of 47½ degrees. The height of the dock is 80 feet from mean water level to the base of rail. Its width on the top, including machinery platforms, is 70 feet, 8 inches; the extreme width across the pockets is 57 feet, 2 inches. The bottoms of the pockets are 43 feet above the lake level, the pockets themselves being, therefore, 37 feet in height. The overall length of the dock is 684 feet, including the end tower but exclusive of approaches, its capacity being sufficient to receive two of the largest ore carriers at one time.

Fig. 5 shows some interesting comparisons between the physical features of the new Northern Pacific dock and various other ore docks previously built on the great lakes. This comparison includes the new Great Northern dock at Allouez, the new Lake Superior & Ishpeming dock near Marquette, the Duluth & Iron Range steel dock No. 1 at Two Harbors, the timber dock of the Soo Line at Superior, and D., M. & N. Dock No. 5 now under construction at Duluth. In this comparison it will be noted that the Northern Pacific dock is higher than any of the others by 2 feet. On the other hand, it is narrower than the Great Northern and Soo docks but wider than the L. S. & I. and D. & I. R. structures. Various other comparative dimensions are given in the accompanying table. It is evident that the designers of the Northern Pacific dock did not lose sight of the information accumulated through the

FIG. 1—NEW NORTHERN PACIFIC ORE DOCK, SHOWING THE POCKETS AND CHUTES

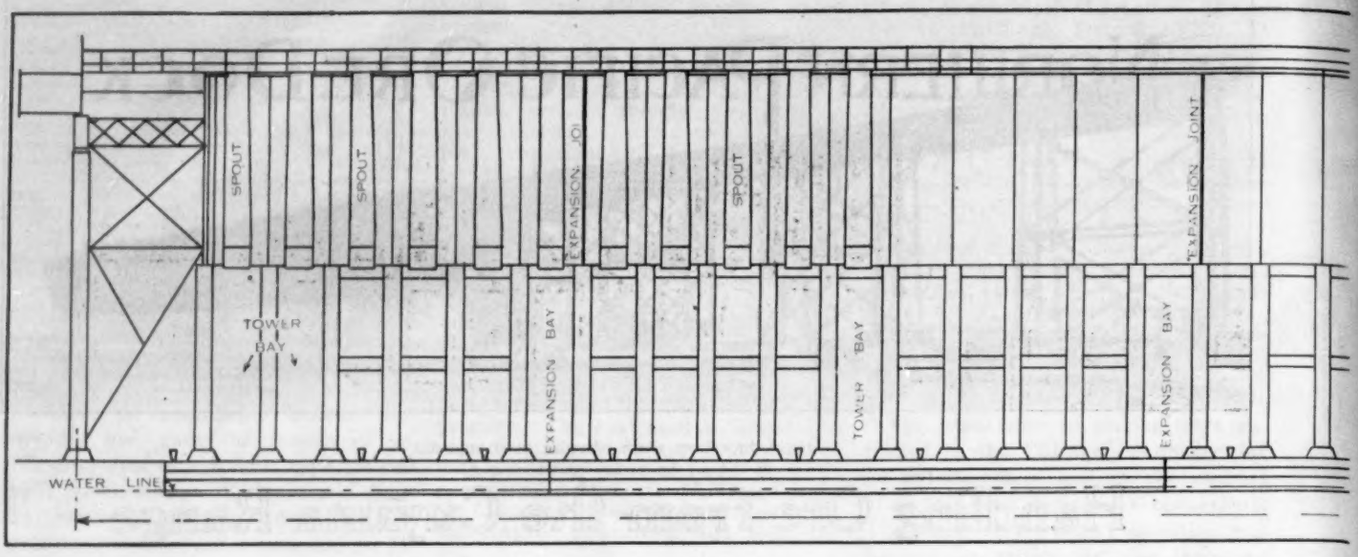


FIG. 2 — LONGITUDINAL ELEVATION OF THE

operation of the older ore docks. The foundation, which is 65 feet, 8 inches in extreme width, is illustrated in Fig. 6. It consists of a concrete slab resting on piling surrounded by a sand-tight wall of 12 x 12-inch sheet piling. The supporting piles are arranged under the concrete columns in rows 2 feet, 8 inches apart, the piles in each row being spaced approximately 2 feet, 6 inches center to center. Batter piles are driven every 12 feet. Expansion joints are left in the foundation every 120 feet. The foundation concrete, of course, is reinforced heavily by steel rods. At the face of the dock, the foundation slab is 6 feet in thickness. Two 12-inch, 35-pound I-beams sunk in the concrete serve as fenders and prevent the vessels lying alongside from injuring the dock. Suitable snubbing posts for taking the lines from steamers are set in the concrete along the face of the dock.

Dock Superstructure

The superstructure is carried on a series of concrete columns, similar to those used in Great Northern dock No. 4. These columns are 2 feet, 9 inches by 8 feet in cross-section and 34 feet, 10 inches in height. They rest on concrete pedestals which are 8 feet, 2 inches high. The pedestals and slab surmounting the piling are constructed of 1:2:5 concrete and the posts of 1:2:4 concrete. The only reinforcing in the columns consists of four ⅞-inch vertical rods, 34 feet, 10 inches in length, embedded 4 inches from each end surface of the column. The concrete columns are in reality piers. They are tied together longitudinally by two sets of reinforced concrete beams each 2 feet deep and 1½ inches thick. The upper row of beams connects the tops of the columns and the lower row is located at a point 16 feet, 5 inches above the top of the pedestals. The sub-structure is further stiffened by lower bays located at intervals of 120 feet along the length of the dock. There are also two tower bays at the shore end and one at the extreme outer end of the dock, as shown in Fig. 2. The adjacent columns in the towers are connected by 12-inch concrete walls.

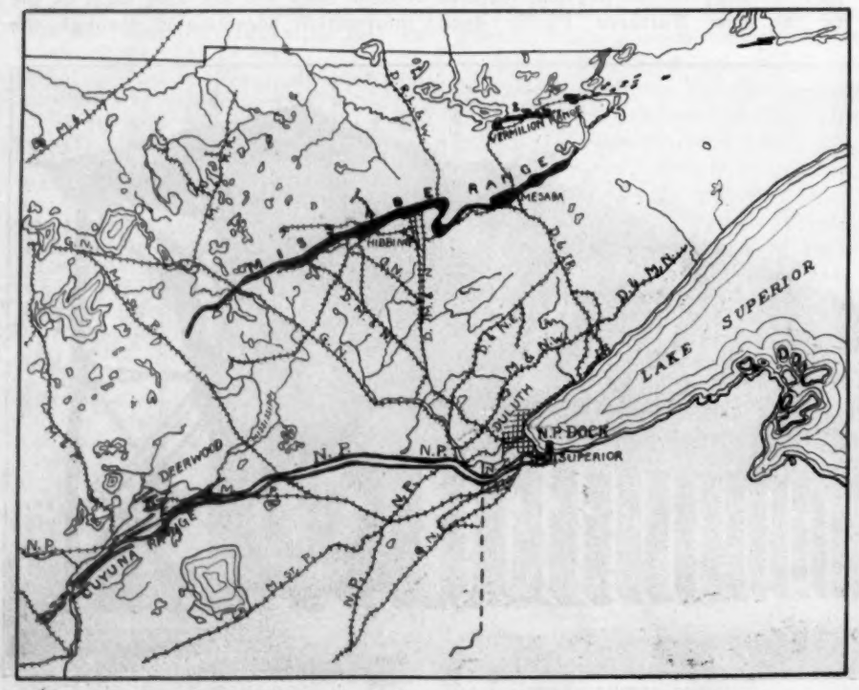
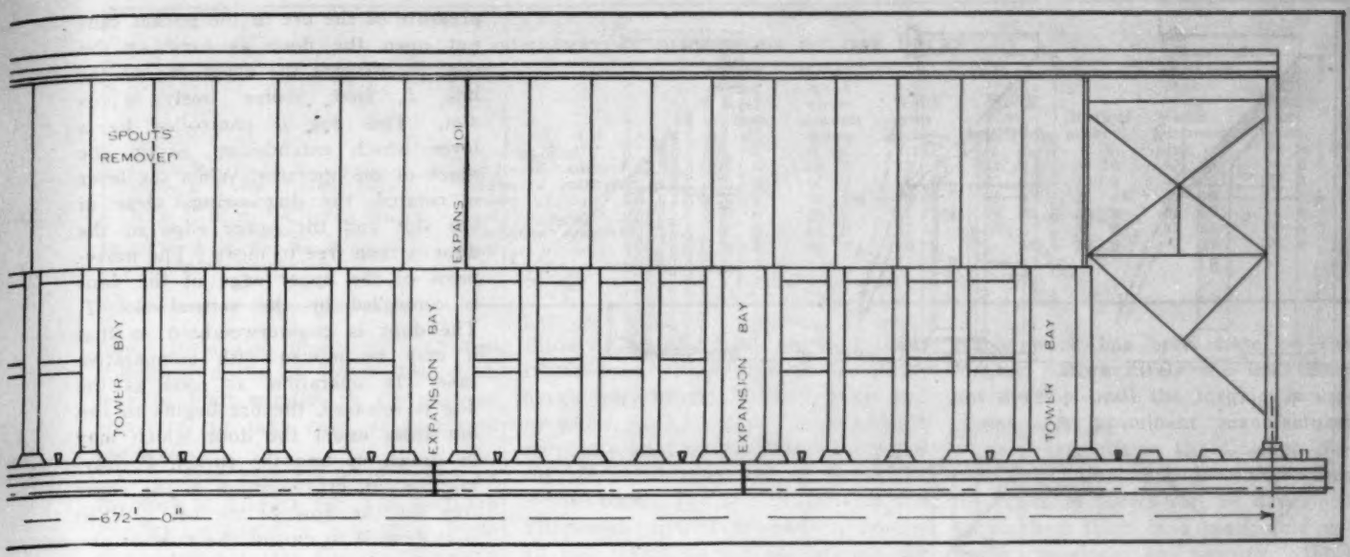


FIG. 3—MAP SHOWING CUYUNA RANGE, NORTHERN PACIFIC DOCK AND NORTHERN PACIFIC ORE LINE

Bin Walls

The bin walls or partitions which connect the two columns in each bent are built of steel plates with a steel Z-bar column under each line of track stringers, the walls being filled out with plain concrete to a uniform surface, flush with the outer faces of the Z-bar columns. The bin floors consist of reinforced concrete slabs supported by heavy I-beams. The slabs are approximately 6¾ inches in thickness. In this respect the construction of the Northern Pacific dock is different than any of its predecessors.

The concrete bottoms of the pockets are floored with 4-inch maple strips in the usual manner. The slope of the bottom of the pockets is 47½ degrees from the horizontal and it is



NORTHERN PACIFIC ORE DOCK AT ALLOUEZ BAY

believed that the ore will slide on the bare concrete as well as it does on the maple flooring. In order to thoroughly test this theory, 10 pockets at the outer end of the dock have been left without any flooring and the concrete has been rubbed to a smooth surface by holystoning with special carborundum bricks.

Ends of Bins

The semi-circular ends of the bins are built of steel plate from ¼ to ⅜ inch in thickness, riveted together like the shell of a horizontal tubular boiler. The semi-circular form is, of course, self-supporting and no posts or bracings are necessary to resist the outward thrust of the ore in the bins. Aside from its simplicity and economy, this construction also aids greatly in the rapid operation of the dock. The curved surfaces are effective in breaking up the arches of the ore body which frequently occur and impede the movement of the material. It has been found by experience that the arches usually form between the sloping floor of the bins and the end walls, seldom between the vertical partitions. On account of the curved surface presented to the ore by the steel plate pocket fronts, the arches are broken up in their incipient stages. This greatly reduces the amount of barring and poking necessary in loading a boat.

Capacity of Pockets

Each of the pockets has a capacity of seven carloads of 820 cubic feet. The weight of the ore is estimated from 120 to 170 pounds per cubic foot, and the capacity of each pocket, therefore, is approximately 371 gross tons, assuming the weight of ore to be 145 pounds per cubic foot.

Four tracks have been laid on the deck of the dock, two over each set of pockets. They are spaced as indicated in Fig. 4.

The Ore Spouts

The spouts are steel, tapered, 5 feet, 10½ inches wide at the upper end and 4 feet, 6 inches at the lower end, with a constant depth of 2 feet. They are each 34½ feet in length and in their lowest position swing 8½ feet above the surface of the water. In common with other modern docks, electric hoists are used for raising and lowering the spouts instead of hand-operated winches. A ⅜ x 5½-inch flat wire rope is fastened to the lower end of the spout and its upper end is wound around a drum connected to an electric hoist located on the machinery platform at the top of the dock. The hoists are operated in groups from a line shaft, 10 drums being connected to each motor. Twenty-five horsepower, 440-volt Crocker-Wheeler motors running 720 revolutions per minute on three-phase current are employed. A friction clutch connects the hoisting drum to the line shaft. A single hand lever operating two brake bands is used to control the speed when lowering. The bands are so connected that one brake is always set unless pressure is applied to the lever. This prevents the spout from falling in case the operator is negligent. The hoists are manufactured by the Whiting Foundry Equipment Co., Harvey, Ill.

The doors controlling the flow of ore from the pockets are built under

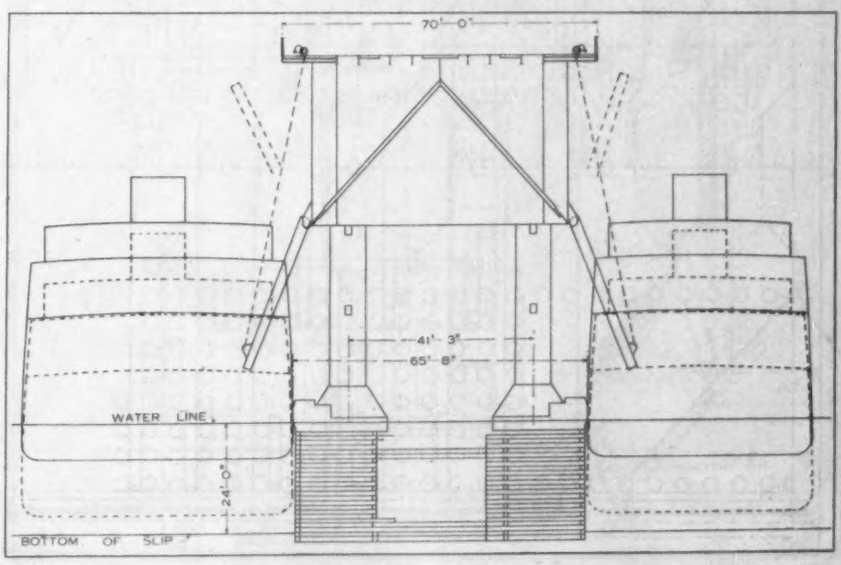


FIG. 4—ELEVATION OF ORE DOCK

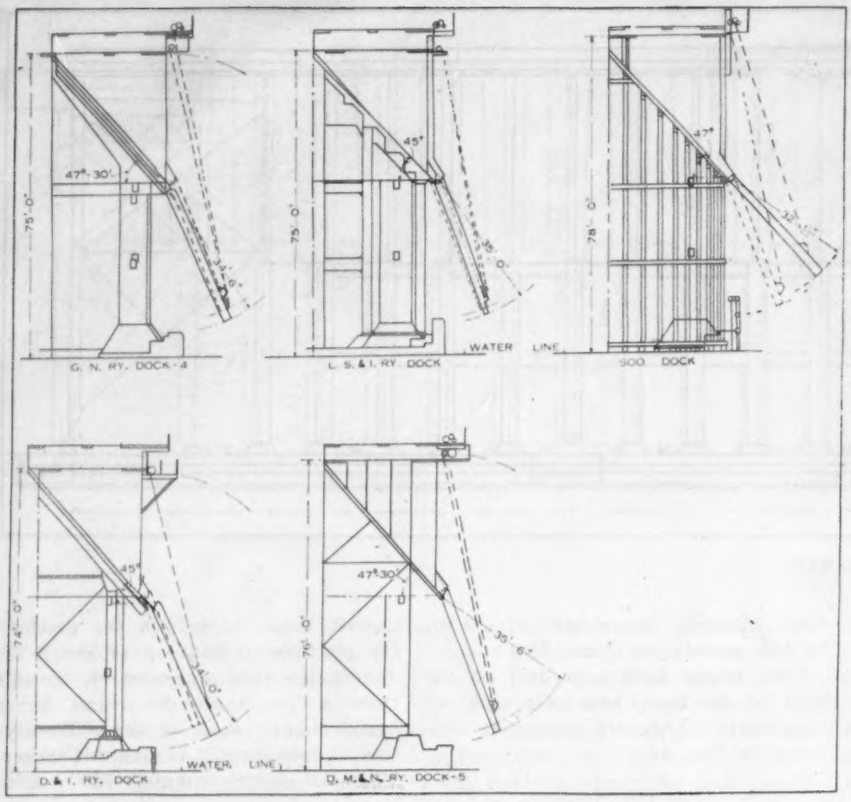


FIG. 5—COMPARATIVE ELEVATIONS OF FIVE LAKE SUPERIOR ORE DOCKS

the Dickerson patents and are somewhat similar to those on D. & I. R. dock No. 1. The chutes have a free opening 5 feet, 10 inches wide and approximately 4 feet in height. The details of the door, which has some features of special interest, are illustrated in Fig. 7. The lower edge of the door is guided by a link, *L*, the upper end of which slides in the slot *S*. The pressure of the ore in the pocket cannot open the door as long as the dog, *D*, prevents the upper end of the link, *L*, from sliding freely in its slot. This dog is controlled by a lever which extends up within the reach of the operator. When the lever is rotated, the dog swings clear of the slot and the lower edge of the door is then free to move. The movement of the upper edge of the door is controlled by the vertical slot *T*. The door is counterweighted so that it may be moved with comparative ease. In operation, as soon as the dog is released, the ore begins to run out from under the door which may be drawn up into the pocket, *P*, leaving the full cross-section of the chute free for the flow of the ore. When it is desired to cut-off the flow of ore, the door is lowered and as the lower edge is guided, it is forced into the stream of ore as it descends. The links and slots are so adjusted that the door describes a curve in lowering so that the resultant pressure from the flowing ore does not interfere with or prevent its closing. Ladders spaced 24 feet apart extend down the side of the dock to a platform which is built over the doors along the full length of the dock. From this platform the individual operating platforms adjacent to each door are reached by short ladders. The dock is lighted by flaming arc lamps suspended on structural steel posts, about 35 feet high. The posts are spaced approximately 55 feet apart.

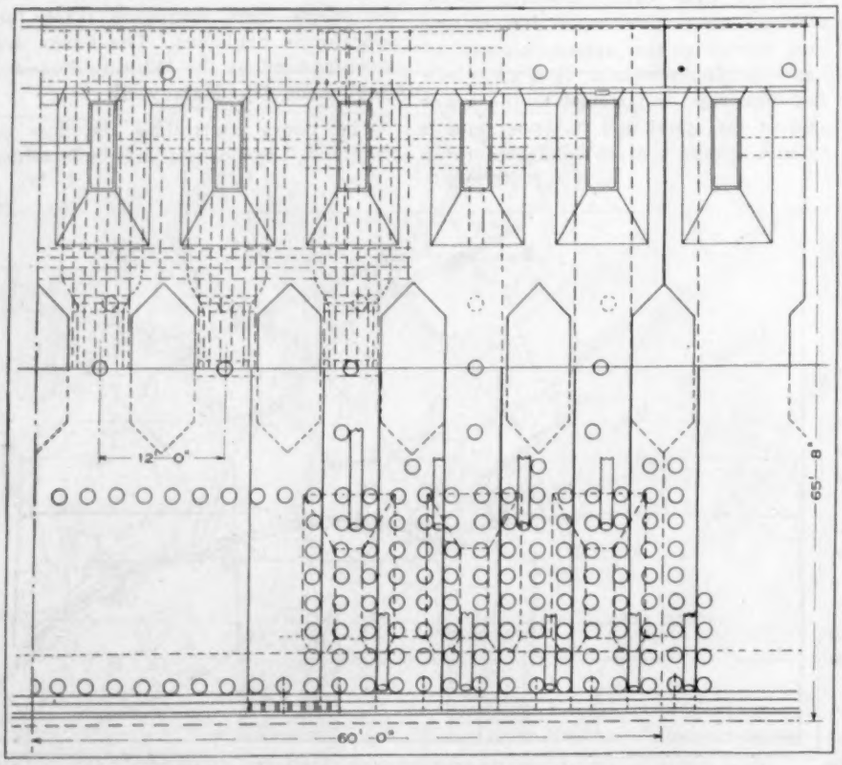


FIG. 6—FOUNDATION PLAN OF NORTHERN PACIFIC ORE DOCK

The Dock Approach

A 300-foot steel trestle approach with a concrete deck is connected to the shore end of the dock. This in turn connects with a 4,400-foot wooden approach trestle. The dock was constructed in an unusually brief space of time. Work was commenced in November, 1912, and on Aug. 24, 1913, the first boat was loaded. The dock was erected under the local supervision of J. W. Bell, assistant engineer, and the general supervision of the Northern Pacific engineering department. The steel and trestle approaches were designed by H. E. Stevens, bridge engineer, and the dock proper by Max Toltz, of the Toltz Engineering Co., St. Paul, Minn. The steel work was fabricated by the American Bridge Co., and erected by the Pittsburgh Construction Co. Siems & Carey, of St. Paul, had the contract for the substructure. The concrete work in the ore pockets was handled by E. S. Johnson & Co., St. Paul. Although the dock at present contains only 102 pockets, it is designed so that it may be extended to 300 pockets in the fu-

COMPARATIVE DIMENSIONS OF ORE DOCKS

Name of dock.	Construction.	Height, water level to base of rail, ft. in.	Height, spout hinge to water level, ft. in.	Width over pockets, ft. in.	Width of foundation, ft. in.	Depth of pockets, ft. in.	Angle of pocket floor with horizontal, deg. in.	Length of spout, ft. in.
G. N. Ry. No. 4 Superior.....	Reinforced concrete.....	75 0	40 2	62 6	71 0	34 10	47 30	34 6
L. S. & I. Ry. Presque Isle.....	Reinforced concrete.....	75 0	43 0	54 0	60 0	32 0	45 00	35 0
Soo Line-Superior	Timber	78 0	42 5⅜	58 0	65 4	35 6⅜	47 00	32 1½
D. & I. R. R. No. 1-Two Harbors.	Steel	74 0	39 3	51 8¾	59 4	34 9	45 00	34 0
N. P. Ry.-Superior.....	Reinforced concrete.....	80 0	43 0	57 2	65 8	37 0	47 30	34 6
D. M. & N. Ry. No. 5 Duluth.... (under construction)	Steel	76 0	42 0	56 0	.. .	34 0	47 30	35 6

ture. It is also placed so that two additional docks of 300 pockets each may be built parallel to the existing structure, to take care of increased ore traffic.

Coincident with the construction of the dock at Allouez Bay, the Northern Pacific organized a subsidiary company known as the Cuyuna Northern railway, to build the necessary spur tracks from the main line, near Deerwood, to various points on the range. At the present time two branches have been constructed: one extends 4 miles from Deerwood southwest to Oreland; the other is located around the west shore of Serpent Lake, penetrating what is known as the north range. This line is about 7 miles in length with a terminus at the Cuyuna Mille Lacs mine.

Largest Fuel Consumer

The Pittsburgh district of Pennsylvania is the largest consumer of fuel in the world, and in magnitude of coal traffic it is also preeminent. The Pittsburgh district in 1912, according to Edward W. Parker, of the United States Geological Survey, consumed 17,721,783 tons of coal and about 5,000,000 tons of coke, or a total of about 22,700,000 short tons, over 10 per cent more than all the boroughs of Greater New York. Moreover, Pittsburgh also consumes millions of cubic feet of natural gas. The total quantity of coal sent to New York harbor ports for local consumption, for bunker trade, and for trans-shipment to coastwise and foreign ports, is between 35,000,000 and 40,000,000 short tons. In 1912 the total coal business of the Pittsburgh district, including local consumption and shipments east and west, amounted to 59,150,179 short tons. The coke used and handled was approximately 14,000,000 tons, making a total of about 73,000,000 tons, or nearly twice as much as the coal going to New York harbor.

The quantity of coal shipped by rail and water to Pittsburgh and through Pittsburgh to points west in 1912 was 43,801,134 short tons, an increase of 4,160,226 tons over 1911. All of this increase was in rail shipments, as those by water fell off slightly, about 100,000 tons. The shipments to Pittsburgh were by rail, 7,778,450 tons, and by water, 9,943,333 tons. The shipments to points west of Pittsburgh were, by rail, 24,086,001 tons, and by water, 1,993,350 tons. The shipments from the Pittsburgh district to eastern points, all rail, which do not go through the city, amounted in 1912 to 15,349,045 tons, against 13,169,866 tons in 1911. The shipments of coke in 1912 were, to Pittsburgh 4,962,207 tons, to points west 5,684,566 tons, and from the Pittsburgh district to eastern points 3,294,656 tons.

Pickling Forging Billets

Manufacturers of heavy drop forgings sometimes have trouble from seams or segregation streaks in their billets. Generally it is impossible to discover these faults before considerable work has been done on the forging. More rarely the fault does not develop until the forging is machined. A prominent manufacturer of drop forgings in the Chicago district has found that in many cases the faults in billets can be developed by pickling them in a weak acid solution previous to heating. This etches the surface slightly and brings out the defects. The results have been so satisfactory that the manufacturer has installed special pickling apparatus in his plant.

Washington state supreme court has ruled against allegations that the workingmen's compensation law denied the right of trial by jury, delegated judicial powers to the commission and violated the federal guarantee of a republican form of government. The case goes to the United States Supreme Court on writ of error.

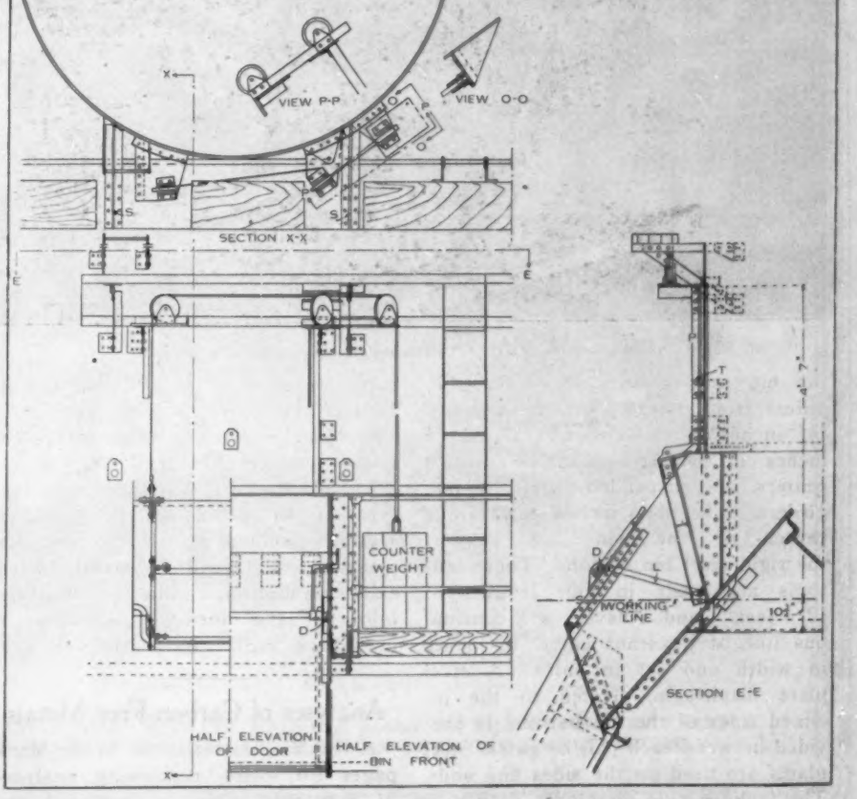


FIG. 7—DETAILS OF DOOR, NORTHERN PACIFIC ORE DOCK

A New Type of Stock Bin

An ore bin, embodying a number of unusual features, has been installed at the blast furnace plant of the Detroit Iron & Steel Co., Detroit. The type is known as the Baker stock bin, of which Arthur G. McKee, engineer, Cleveland, who made the installation, is the licensee.

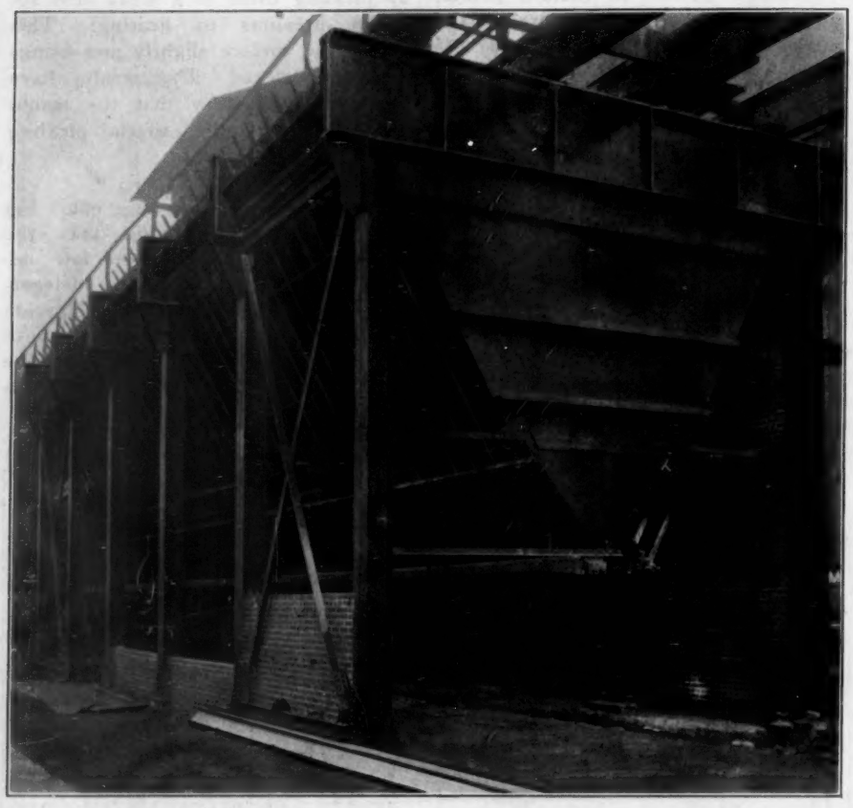
The construction provides a steel trestle of the usual type, the bin bents supporting steel rail stringers for two standard gage tracks, and for two box girders consisting of I-beams with cover plates. The bin containing structure is suspended from these girders, as shown in the accompanying illustration.

It is in the method of supporting the bin proper, that the Baker bin differs from other types. Steel bolts, 1¾ inches in diameter and 17 feet 5 inches in length, spaced on 18-inch centers, are suspended from the box girders. The bolts incline toward the center of the bin and support the rigid steel bin bottom. These bottoms are made in unit lengths of 12 feet, and have a continuous line of quadrant gates, 18 inches in width and set in pairs. A steel plate diaphragm, riveted to the inclined sides of the bin bottom, is provided between each pair of gates. Steel plates are used on the sides and ends. The inclined side plates are supported by the 1¾-inch bolts, while the end plates are bolted to the side. The lower edges of both end and side plates are supported also by the bin bottom. Two bars, one on either side, are riveted to the lower edges at the ends, forming a slot, in which the end plates of adjacent bin bottoms are fitted.

The sides, bottoms, end diaphragms and supporting rods are separably removable, and all portions of the containing structure are interchangeable. Thus the removal of a damaged part is permitted with a minimum of expense and labor.

Another advantage claimed for this type is the complete discharge of the contents due to the placing of the gates in a continuous line. The number of field rivets in the bin structure varies from 18 to 25 per ton weight, making the amount of labor and equipment required for the field erection, extremely low.

Three additional installations of this type of stock bin are being made. Designs embodying the suspension principle, and with concrete sides, ends and bottoms, indicate the possibility of this form of construction in storing coal, stone, sand, etc.



THE NEW STOCK BIN OF THE DETROIT IRON & STEEL CO.

Analyses of Carbon-Free Metals

A booklet, interleaved with blank pages for notes, containing analyses of carbon-free metals, is being distributed by the Goldschmidt Thermit Co., New York City. The following determinations are given: Vanadium in carbon-free ferro-vanadium alloys; titanium in carbon-free ferro-titanium; carbon-free ferro-molybdenum alloys; tungsten in carbon-free ferro-tungsten alloys soluble in acids; manganese and chromium. This work should prove of value to chemists affiliated with metallurgical establishments generally.

Commercial Aspects of Oil Engines

The investigation of oil engines, recently conducted by United States government naval engineers, with a view to installing them as prime movers on some of the new government vessels, directs attention to the development and success of this type of internal-combustion engines up to the present time. More than 300 vessels are now in service propelled by Diesel engines, and the indications are that this number soon will be materially increased, especially if the attitude of the United States government continues favorable. On land this type of prime mover has attained a great degree of popularity, particularly in Europe, and it is probable that its use in this country will be considerably extended within the next few years.

The oil-burning internal combustion or Diesel type engine takes its fuel into the cylinder without any previous transforming, and there converts it into energy, exerting that energy directly on the crankshaft through pressure on the piston head without intermediaries. This engine was invented by Dr. Rudolph Diesel, of Munich, Germany, in 1893.

A new treatise on these engines has recently appeared in the form of a book by A. P. Chalkley, entitled "Diesel Engines for Land and Marine Work". This is the first publication to deal exclusively with the subject, and is of special interest at this time. In view of the commercial importance of the subject, the author has endeavored to prepare the work so as to render it suitable for those who, for widely differing reasons, find it necessary to familiarize themselves with this type of internal-combustion engines. While this necessitated including a certain amount of elementary discussion for the aid of non-technical readers, the purely engineering aspects of the question have been well cared for. Another comprehensive treatise which also will be found of value by those having a practical interest in the subject is a bulletin issued by the Lyons-Atlas Co., Indianapolis.

THE ABC OF IRON AND STEEL

Wire and Wire Rods—IV

By Kenneth B Lewis

Most buyers insist on receiving a wire of the exact temper which experience has shown them to be best suited for their work and their requirements may be met with dead soft wire or wire drawn one light draft, or two or more drafts, from the annealing point. Considering the possible variations of carbon in the steel, the variations in the amount of reduction per draft (which affects the stiffness of the wire) and the possible variations in annealing methods as well as the point at which annealing is done, the number of drafts after the last annealing and other variable factors, the reader will readily believe that there are literally thousands of drawing schedules followed, to insure each customer receiving wire of the exact temper and quality he requires. A large jobbing mill may have at one time several hundred lots of wire in process, each of which requires a distinct drawing practice, and although many lots can be carried together through various steps, each individual order must be carefully watched and in many steps, separately handled.

This condition has made it impossible to introduce into general wire mill practice the continuous processes and automatic handling devices which one naturally associates with large establishments of this nature, and is, perhaps, largely responsible for the failure of the wire drawing industry to make such progress as has been shown by other branches of the metal trades. More fortunate in this respect are the mills devoted exclusively to the common products,—nails, fence, bale ties, etc., for in such mills a close approach to uniform drawing practice is possible. Even here, however, variations in the composition, temper and uniformity of gage of the rods make necessary frequent departures from standard practice.

Nuisance of Wire Gages

Wire gages are an unmitigated nuisance and there is a growing disposition on the part of consumers to make their specifications in decimal parts of an inch. Among the half dozen different gages employed in this country the one in most common use is the Washburn & Moen, sometimes known as the American Steel & Wire gage. In this gage No. 1 (0.283 inch) originally represented the size resulting from one draft from the smallest available

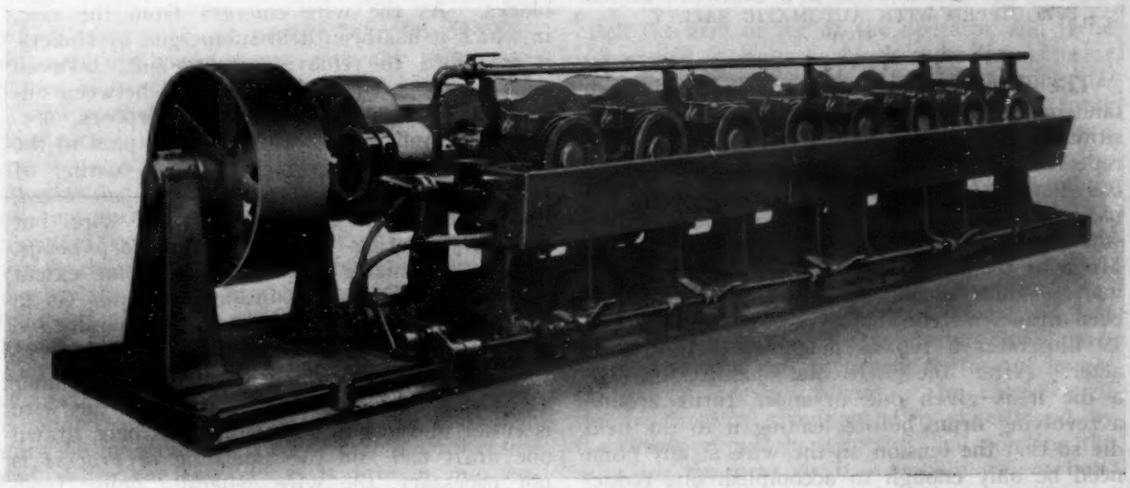


FIG. 19—ONE TYPE OF CONTINUOUS WIRE DRAWING MACHINE BUILT BY THE WATERBURY FARRELL FOUNDRY & MACHINE CO. NINE REDUCTIONS ARE MADE ON THE WIRE SIMULTANEOUSLY

wire rod; No. 2, the result of the second draft, etc. At the present time these numbers represent nothing at all. The rods are now hot rolled to No. 5 and the use of softer and more uniform steel, better dies, and machinery of heavier construction, have resulted in the practice of skipping two or three gage numbers at a single draft. A characteristic drawing schedule, for instance, might run as follows: No. 5 soft Bessemer rod, clean, coat, bake, draw to No. 8¼, No. 10¾, No. 12½, anneal, clean, light lime coat, bake, draw to No. 13¼ for bright, soft Bessemer. The gage numbers are purely arbitrary and are not even consistent, some intervals being light reductions and some heavy. The use of automatic forming machines whose dies require stock very close to specified sizes, is largely responsible for the growing practice of specifying in thousandths of an inch, a tendency deserving the hearty support of all wire users.

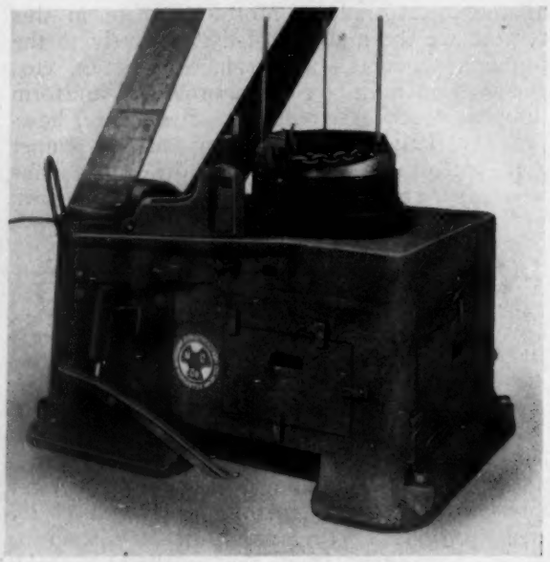


FIG. 20—FRICTION CLUTCH ROD DRAWING BLOCK EQUIPPED WITH AUTOMATIC SAFETY STOP

The continuous drawing of wire through tandem dies is in theory as attractive a proposition as continuous rod rolling. It has been repeatedly tried and, except in the small sizes, has never proven a commercial success. It has, however, many applications among the smaller gages where wet drawing is the rule. Much of the mattress wire, broom wire, weaving and fine netting wire in the market has been drawn on continuous wire machines. Fig. 19 illustrates a typical machine of this character. After the wire has passed through a die it is given one or more turns around a revolving drum before leading it to the next die so that the tension on the wire at any point need be only enough to accomplish one reduction. The drums must be driven at proper speeds to compensate for the increased length due to each reduction. Any undue wear in one of the series of dies throws a more severe reduction on the following die, disarranges the proper speed regulation, and frequently results in a broken wire. In the smaller sizes the dies are frequently commercial diamonds, each one carefully set in a brass plate and pierced with a tapering die hole. Such dies are subject to only very slight wear and unless broken by heavy drafting last for a long time, being occasionally redressed until the hole is too large for the strength of the stone.

Continuous drawing in the larger sizes has never been commercially successful. Wearing of one or more dies forces the wire to travel at a slower speed than its forwarding drum and, slipping on the surface of the drum, the wire rapidly wears grooves in which it becomes entangled, to the detriment of its coating. One machine recently patented provides for this contingency by supplying the drums with differential gearing so arranged as to permit a change of pace rather than to force the wire to slip. This machine is finding a limited use in dry drawings and in certain cases the process has proven more economical than single drafting.

The galvanizing or zinc coating of wire is accomplished by passing the wire as a single strand through melted zinc. The bundles, just as delivered from the drawing blocks, are thrown onto reels and the wires, after threading through acid to remove the coating, and then through the spelter kettle, are led onto revolving blocks which serve the purpose of coiling the wire again into bundles and also supply the tractive effort necessary to pull the wire through. Thirty wires, side by side, generally constitute one galvanizing outfit. With most grades of wire it is customary to include a continuous annealing furnace in the series, the wire passing first through the furnace, then through the acid which removes the resulting scale, through the spelter and onto the take-up blocks. As the wire emerges from the zinc, in which it has been held submerged by sinkers, it is wiped to remove surplus zinc, between pads of prepared asbestos pressed between adjustable plungers. For certain purposes, notably telegraph wire, it is allowed to pass to the blocks unwiped, carrying a heavy coating of zinc. This wire, known as *extra galvanized,* resists corrosion longer than wiped wire, but its heavy coating will not stand sharp bends. Electro-galvanizing is practiced to some extent on wire, being done upon single strands, as in hot galvanizing, but the process is generally too expensive for common products.

Tinning is performed in the same manner as galvanizing, except that as a rule the wire is either fine bright annealed or has been drawn one draft *wet* and the annealing *in process* is not necessary, the wire generally going from the reel direct to the acid and then into the melted tin.

To a large extent it may be said that the history of the art of wire drawing is yet to be made. The fact that no notable improvement in wire drawing arrangements has been made in the past 500 years has not, however, been due to absence of points of attack. One inconsistency is the practice of alternately making scale and removing it by acid in the process of annealing and cleaning. Bright process annealing on a commercially successful basis, that is, the annealing of wire in such a manner that it may be drawn with no intermediate cleaning and coating, is a problem as yet unsolved. It is a problem as attractive as perpetual motion, and its pursuit is attended by the same thrills, the same near-successes and the same disappointments. The wire may be annealed without forming a particle of scale, but there remains upon it a film of lubricating material, once active, now baked out of all usefulness, which apparently can neither be removed without acid nor made to act with any other substance as a satisfactory lubricant.

The wire drawing device itself, as commonly constructed, is a mechanical horror. The drawing strain is transmitted diagonally across bolted joints from the spindle bearing mounted on one member of the bench to a die box mounted on another member, a construction which could not be more cleverly designed to destroy the rigidity of the frame and the alignment of the shaft. This undesirable end is hastened by the severe shock to which the whole frame is subjected each time a block is started. To the inertia of the heavy block is added the drawing strain, both of which must be overcome in a small fraction of a second, when the jaw clutch is thrown into engagement, one of the least serious results being frequent breaking of gear teeth. The jaw clutch raises the loaded block from a state of rest to full speed in approximately one-fiftieth of a second. The lost time is employed in putting a torsional strain into the spindle, which, as the block starts, recoils violently, giving up its strain as excessive speed. A few inches of wire at this point are jerked through the die at about double the intended drawing speed. The effect of the high speed is suffered by the die hole, with no compensating advantage of the tonnage that such a speed should yield. Some progress is now being made in this direction, by the perfecting and gradual adoption of blocks which are thrown into engagement by individual friction clutches. Indications are that their use may result in higher drawing speeds and efficiency, and lower maintenance charges.

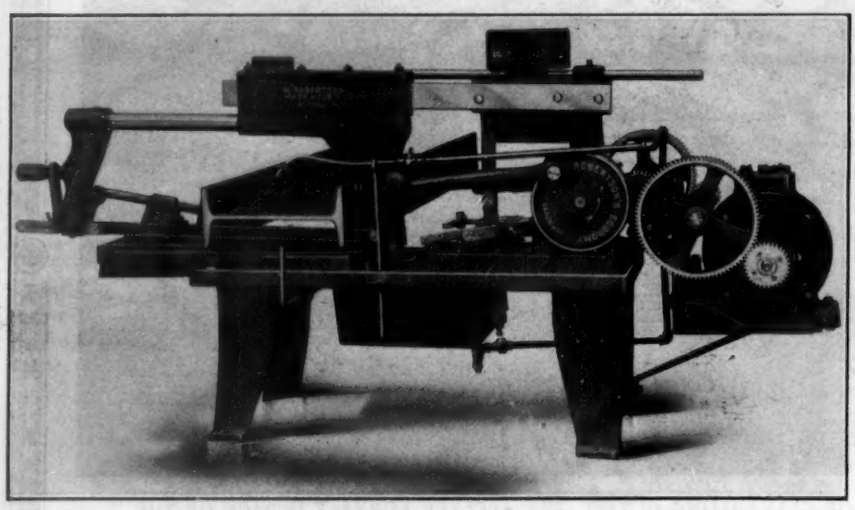
Distressing accidents at the wire benches are by no means infrequent. Loops of tangled wire on their way to the die will occasionally catch the arm or leg of the operator and if he is not able to stop the block, a broken bone or severed limb may result. Safety stopping devices are of uncertain value, as the force necessary to disengage the jaw-clutch during a heavy draft is often beyond their capacity. Here again the friction-driven block offers a solution, and the use of such blocks to which reliable safety appliances may be readily adapted is rapidly extending.

There is a field for practical devices to reduce to a minimum the severe labor and loss of time involved in stripping the block, and, more important still, to permit the use of longer continuous lengths of wire. The efficiency of the block at a given speed is determined by the time occupied in stripping, and pointing the wire for the next draft. Double weight bundles mean at once a halving of the total time per ton lost in these operations.

FIG. 21—"TAKE-UP" BLOCKS OF GALVANIZING OUTFIT. THE SPELTER FURNACE IS BACK OF THE "TAKE-UP" FRAME AND IN THE EXTREME BACKGROUND IS THE CONTINUOUS ANNEALER

Motor-Driven Sawing Machine

A motor-driven machine for cutting steel beams, angles, etc., built by the W. Robertson Machine & Foundry Co., Buffalo, is shown in the accompanying illustration. This machine has a frame bearing 14 inches long, which is milled from the solid, with provision for two adjustments, top and side with gibs. The head, pulley and pinion bearings are 6 inches long. The surface of the bed is planed where the vise is supported and the housing for the head is milled, providing additional support for the bolts securing the head to the bed and insuring perfect alignment. The machine is equipped with a device for raising the frame on the idle stroke, thereby eliminating drag on the teeth. The cutting compound is contained in a tank underneath the bed and this is delivered to the blade by a pump. To insure the most economical results the machine should be operated at a speed of from 90 to 95 strokes per minute. The machine is equipped with a friction clutch and stops automatically when the cut is finished. In the accompanying illustration the machine is shown cutting a 12-inch, 33-pound I-beam. The machine is built in various sizes for cutting steel from 6 inches up to and including 8 x 18 inches. The blades used vary in length from 10 to 24 inches and the stroke is 6 inches. The ½-horsepower motor is mounted on a pad supported at the end of the frame.



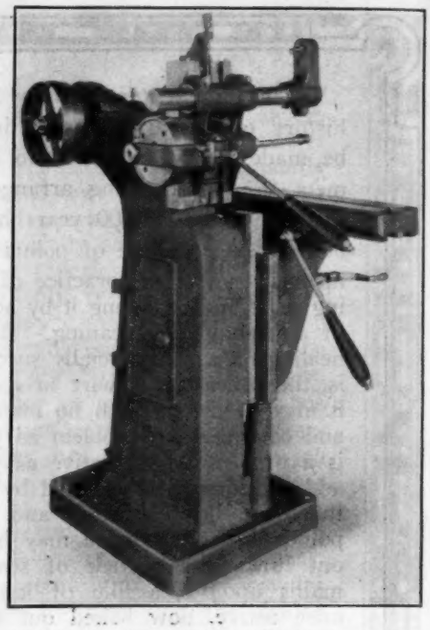
HIGH-SPEED, MOTOR-DRIVEN STEEL CUTTING MACHINE

New Milling Machine

The C. G. Garrigus Machine Co., Bristol, Conn., is building a milling machine designed for the rapid machining of small work, such as keyseating, profiling, cam-cutting and numerous other operations usually performed on a hand milling machine. In designing this miller, the Garrigus company, in addition to providing ample power and range, endeavored to eliminate certain defects of construction and operation which are sometimes found in hand millers. To eliminate the belt slippage from the back shaft to the spindle while taking heavy cuts a 2 to 1 gear was placed in the head. The machine shown in the accompanying illustration is provided with a Brown & Sharpe type double-end taper spindle. The bronze spindle bearing sleeve is long and has a double end taper, while a reservoir in the center assures ample lubrication to the taper bearing. The gears, when not in use, revolve together, as in planetary transmission construction. The cone pulley back shaft is fitted with combined radial and thrust bearings.

The machine may be fitted with a No. 9 Brown & Sharpe taper or a No. 3 Morse spindle. The spindle has a vertical feed of 6 inches and there are six changes of spindle speeds. The overhanging arm may be turned out or removed. The table working surface is 5 x 22 inches, and is provided with one T-slot. The distance from the top of the table to the center of the spindle is 17 inches. The table is operated by a crank or lever connected to rack and pinion. The length of the hand lever feed is 6 inches and that of the crank lever feed, 18 inches. The transverse movement of the table is 6½ inches.

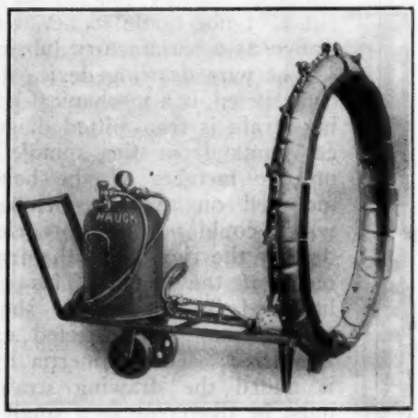
The Metal Treating & Equipment Co., Inc., 1784 Broadway, New York City, has established a plant at 834 Humbolt street, Brooklyn, to engage in jobbing galvanizing work by its improved process of electro-galvanizing.



MILLING MACHINE BUILT BY THE GARRIGUS MACHINE CO.

Portable Tire Heater

A portable machine for heating steel tires, built by the Hauck Mfg. Co., Brooklyn, N. Y., is shown in the accompanying illustration. The tire casing can be adjusted to tires from 33 to 96 inches in diameter and crude, fuel or kerosene oils can be used in the burner. The flexible casing consists of sectional, interchangeable steel segments, to which are attached brackets provided with an index to aid in setting the casing to any required diameter of tire. The outfit is furnished on a steel frame truck, or, if desired, the truck can be omitted. A stationary type of heater also is built which consists of an oil burner placed in the center of a nest of tires to be heated. The flame is directed against the inside diameters of the tires, thereby insuring rapid and uniform heating.



PORTABLE TIRE HEATER BUILT BY THE HAUCK MFG. CO.

IRON AND STEEL MARKETS

Foreign Mill Products Are Not Yet a Menace

As American Consumers Prefer American Goods—German and English Iron and Steel Not Regarded With Great Favor

BY GEORGE SMART

Extreme reluctance to import iron and steel unless there is a distinct price advantage is being shown by American consumers who have been investigating the foreign markets since the enactment of the new tariff law. Hence foreign competition does not promise to be an important factor unless prices in England and Germany decline sharply, or remain stationary while prices in this country advance several dollars per ton. In the case of billets, which are now on the free list, an American company has met German competition, although the buyer paid them $1 to $2 per ton more for the steel than would have been necessary for him to pay for the German product. This shows that quality is an important factor. A Richmond consumer has placed a trial order with German makers and is reported to be still in the market. Owing to the very active demand for steel for reinforcing concrete, importers have been investigating as to the possibility of importing German material, but no importing has as yet resulted. German rounds for bolt making have been quoted $5.50 under the domestic price, but the German steel was rejected on the ground that it is very much inferior to the American product for bolt manufacturing purposes. A New York ship building company is understood to be figuring on small German shapes. Experiences of another ship building company in the east with foreign steel have been unsatisfactory. A Philadelphia company which recently investigated as to the price of Scotch steel-making iron, similar to our Bessemer, found the price fully $2.50 above that quoted by eastern Pennsylvania makers. Eastern pipe makers express the opinion that English makers of pipe iron will have to do a dollar a ton better than at present before they can compete with the American product. Observers who have watched the market for many years state that English warrants for pig iron seldom fall below 50s, and when they do, as the result of speculation, the reaction comes quickly, especially if there is any demand from America.

Structural Material

Very active competition continues on fabricating and erecting of structural material and 1.35c, Pittsburgh, is being freely quoted in eastern territory and to some extent in other parts of the country on the plain material. Contracts for the week include 2,500 tons for the Los Angeles pipe line, awarded to the Lacy Mfg. Co., and 272 tons for the same line to the Llewelyn Iron Works; 2,500 tons for lock gates for Puget Sound waterway near Seattle, to the Penn Bridge Co.; New York Telephone Co. building, New York, 2,200 tons, to Levering & Gerrigues. The Yale Club of New York, 3,000 tons, has awarded the general contract for its building, to Marc Eidlitz & Sons. The steel will probably be furnished by the American Bridge Co. The Riter-Conley Mfg. Co. has taken 1,200 tons for oil tanks from the Penn Mex Fuel Co. The government has awarded the Concrete Steel Co., of New York, 1,900 tons of reinforcing bars for the Panama canal.

Railroad Buying

Increased interest on the part of some railroads has aroused the hope of prominent men in the steel business that very large orders for cars will be placed during the next 60 days and some positive statements have been made as to orders likely to be entered, but inquiries of a definite form have not developed for more than 10,000 cars and some car builders are very dubious as to there being any heavy ordering during the next few months, while the question of advancing freight rates is still pending. The Norfolk & Western is inquiring for from 10,000 to 15,000 tons of steel to be used in building hoppers in its own plant. The rail order for the Australian Transcontinental line, on which American mills were permitted to bid, has not resulted in any business coming to this country, as 27,000 tons were awarded to an English firm, 17,000 to an Australian concern and 10,000 tons were withdrawn.

Decreased Activity

The evidence of decreased business is showing more clearly in mill operations, particularly in eastern territory, where production is being sharply curtailed. Throughout the country, there is, however, evidence that material in the hands of manufacturers is very low and it is believed that, if conditions improve, the demand for prompt shipment will be very strong. In spite of the early delivery being given by mills, many warehouses are doing an active business.

Old Material

Old material continues to decline to remarkably low levels. The increasing practice of many users of scrap is to buy direct from the railroads, following the example of the Steel Corporation, which has not bought scrap from middlemen since 1907. Heavy steel at Cleveland is selling at the lowest price since 1897.

Car Buying is Expected at Pittsburgh

And General Feeling is Hopeful, But Market at Present is Very Quiet — Coke is Weak

BY C. F. WILLIAMS

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, Oct. 21.

The new tariff and the proposed currency bill continue to cause uncertainty in the iron and steel trade, and indications are that increased freight rates, asked by eastern railways, will not be definitely acted upon for at least several months. This delay may defer or decrease equipment purchases by railroad managers. Notwithstanding these influences, manufacturers appear more optimistic about the future, and believe that an active buying movement is not far distant. Consumers are buying cautiously, as has been the case the last five or six months, but are urging shipments in practically every instance, indicating that stocks are low. Western railroads are placing orders for 1914 rails, and eastern roads are expected to figure in the market before the end of the month. Car builders report that prospects of a heavy buying movement are much brighter.

Pig Iron.—The market is almost lifeless. Sales of steel-making grades have been lighter this month than during September, the lightest month in the year. Consumers are buying only for immediate needs, but are urging shipments, and no stocks have been accumulated. Unless conditions become more encouraging, it is not improbable that three or four furnaces in this territory will go out of blast next month. The Standard Sanitary Mfg. Co., as briefly noted last week, bought 1,500 tons of No. 2 foundry and 750 tons of gray forge for shipment the remainder of the year at $13.75 and $13.40, respectively, at valley furnaces. In July, the Standard company obtained foundry at $13.65, valley.

Ferro-Alloys.—As reported last week, German ferro-manganese is showing irregularity, and sales at $49, seaboard, or $1 a ton under the previous prevailing price, are noted. Fifty per cent ferro silicon continues strong at $75, Pittsburgh, but lower grades are weak.

Plates.—No inquiries of importance are before the trade, but it is apparent that concessions could be obtained on either plates or shapes. Leading mills continue to quote 1.40c, but tonnage has been sold at 1.35c, and a range in quotations from 1.35c to 1.40c appears to represent the present market for plates and from 1.35c to 1.45c for shapes.

Sheets.—A week ago, some of the smaller mills were offering concessions of about $1 on black sheets, and it is understood that some of the larger mills have quietly taken tonnage at lower figures this week. No. 28 gage black sheets are quotable at a range from 2c to 2.10c and No. 28 gage galvanized sheets are listed at 3.05c to 3.15c.

Rails and Track Material.—Rail manufacturers expect to book tonnage for next year's shipment before the end of the month; buying already has begun in the west. Indications are that railroads will buy about as heavily as a year ago. Demand for light rails continues good. Track fastenings are quiet.

Billets and Sheet Bars.—Sheet bars are slightly weaker, and sales at $23.50, mill, are reported. Billets continue to be held at $23, mill, but the price has not been tested recently. Forging billets have sold at $28, Pittsburgh, within the last week, or $2 a ton below the previous price. Leading mills, all of which are in a position to offer material, are not attempting to figure in the market, although some of them are quietly offering tonnage.

Hoops and Bands.—The market remains unchanged in position. Hoops and bands are listed at 1.60c and 1.40c, respectively.

Iron and Steel Bars.—Despite slight irregularity reported at Chicago a week ago, the market for steel bars in the district remains firm at 1.40c, and this product continues to be one of the strongest on the list. Iron bars are quotable at a range from 1.50c to 1.55c, but the bulk of the tonnage is selling at the minimum figure, despite the fact that some makers are refusing to shade 1.55c. Shafting is quiet, and somewhat uncertain.

Muck Bar.—Labor conditions remain unchanged. Officials of the United Sons of Vulcan deny reports emanating from Youngstown that a referendum vote is being taken to adopt a sliding scale for puddling, similar to that of the Amalgamated Association of Iron, Steel and Tin Workers. Six of the larger mills are idle. Muck bar is nominally listed at $30, Pittsburgh.

Bolts, Nuts and Rivets.—Nut and bolt makers have considerable tonnage on their books, but manufacturers in need of tonnage appear willing to offer slight concessions. The market is quiet so far as new buying is concerned.

Tubular Goods.—No changes in discounts have been announced by iron or steel pipe makers, but some irregularity has featured the trade the last week or ten days. At least one maker of boiler tubes continues to offer concessions on certain sizes. An order for 30 miles of 8-inch line pipe for southwestern shipment has been placed with a mill in this district.

Tin Plate.—Continued reductions in sheet bar prices make the future price of tin plate somewhat uncertain, although no intimation has been had that this product will be listed below $3.50 for base price.

Wire.—Leading makers have given up their attempt to obtain $1.65 and $1.45 for wire nails and plain wire, respectively, and the market is quotable at $1 a ton under those figures. Consumers are buying only for immediate requirements, but apparently no stocks have been accumulated, and activity is expected to prevail just as soon as general conditions are more settled.

Wire Rods.—Reports of shading are heard, but sales have not been heavy enough to test prices.

Coke.—Furnace coke has sold at $2 a ton, or 50 cents under the price of a few weeks ago, and reports are heard that some grades have been offered at $1.90, ovens. Leading makers are not attempting to figure in the market, but declare they would not sell at prevailing low prices. Foundry coke is quotable at a range from $2.75 to $3, ovens, with standard grades bringing the latter figure. The Connellsville *Courier*, for the week ending Oct. 16, says production was 386,890 tons, an increase of 28,602 tons compared with the week before.

Old Material.—With heaviest consumers obtaining the bulk of their scrap direct from railroads, middlemen are experiencing difficulty in selling at the low levels prevailing today. Heavy melting steel has declined to $12 a ton, or 50 cents under the price that was obtained for several months. Other grades are correspondingly weak, and prices are nominal.

The plant of the American Enamel Works, Providence, R. I., almost destroyed by fire several weeks ago, is being rebuilt. The main structure will be 108 x 139 feet, with two ells, 42 x 82 and 25 x 75 feet.

Chicago Market Still Tends Downward

Freight on Finished Materials Being Absorbed in Part—Slightly More Activity in Railway Buying

BY H. COLE ESTEP

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, Oct. 21.

In the Chicago district, the tendency of iron and steel prices continues downward and there has been practically no change in the influences at work on the market. Some slight revival of railroad buying is evident, but the volume of business so far obtained from this source is not sufficient to restore the balance between consumption and productive capacity. The tendency to shade the freight differential between Chicago and Pittsburgh, which always appears in dull times, is again in evidence. Prices, particularly on plates, structurals and bars, are exhibiting considerable irregularity and there is a wide spread in quotations. This arises from the fact that the mills are treating each order on an individual basis. Business in the lighter finished lines including sheets, wire and pipe is fairly satisfactory. Wire prices are being maintained in the west, but sheet quotations remain weak. The Chicago scrap market is slipping fast.

Pig Iron.—Aside from the purchase of 1,000 tons of local foundry iron for prompt shipment by a prominent manufacturing interest, there have been no noteworthy transactions in pig iron during the past 10 days. Northern foundry remains well anchored at $15, Chicago furnace, and it is now apparent that there will be no increase in quotations for second half delivery. So far, however, very little business has been closed for shipment beyond this year.

The American Seating Co., of Racine, is in the market for 300 tons of southern foundry. There are a few other scattering inquiries, but the total tonnage under negotiation is not sufficient to relieve the market from its general dullness. There is a slightly softer tone in quotations for southern iron. This is due partly to tariff influences and also to the uncertainties surrounding the freight situation.

Merchant Bars.—Evidence that steel bars have been sold at prices closely approximating 1.53c, Chicago, is now conclusive, although there is no doubt at the same time that there is considerable business going at the full price of 1.40c, Pittsburgh. Both producers and consumers, however, are convinced that quotations on bars must undergo a readjustment such as has already taken place in some other lines. By quoting extremely low prices, one of the leading producers of iron bars in this territory has been able to obtain enough business to keep its mills running at their full capacity. This has necessitated prices as low as 1.20c, Chicago, in some cases. Other iron mills in the Chicago district are operating at about 60 per cent capacity. There is a fair demand for reinforcing material and hard steel bars are moving with considerable freedom at 1.45c, Chicago. Both hoops and bands continue firm and are in fairly good demand. The discount on shafting out of stock is now 60 per cent in carloads and 55 per cent for less than carloads. The warehouses report a large number of orders.

Plates and Structurals.—The Illinois Steel Co. has obtained specifications for 10,000 tons of car plates and shapes for the 2,000 cars recently ordered by the Chicago & Northwestern. In general, however, the market shows practically no change, plates being weak at 1.35c, Pittsburgh, and shapes a little firmer. The mills are treating practically every order on an individual basis, quoting such prices as are deemed necessary to land the business. In some cases, the freight differential between Pittsburgh and Chicago is being liberally shaded. This condition results in extreme irregularity and a wide spread in quotations. There is comparatively little new car business in the market.

Rails and Track Fastenings. — A formal award of the Great Northern rail order has been made; about 25,000 tons will be rolled by the Illinois Steel Co.; 5,000 tons by Lackawanna, and an equal amount by the Bethlehem Steel Co. A liberal order for track fastenings accompanied this contract.

Bolts, Nuts and Rivets.—The rivet situation shows very little change from week to week and the pressure for low prices continues unabated. Some of the new plants in this territory are still inoperative. Quotations are showing a wide spread and it is almost impossible to determine the bottom of the market. At the present time, 1.95c, Chicago, will be quoted on structural rivets in small quantities and attractive orders would undoubtedly bring out lower prices.

Sheets.—The volume of business in both black and galvanized sheets is fairly good and the mills in this territory are operating on satisfactory schedules. Prices, however, remain unstable and competition, particularly from outside points, is keen. Undoubtedly the minimum quotations are being shaded, although it is difficult to determine the extent of this practice.

Wire Products. — Although orders from the west have been exceedingly satisfactory, some unsettling conditions have been injected into the market through lower quotations made in the east. Undoubtedly the weak situation which exists in the Pittsburgh district will eventually have an effect on this market.

Cast Iron Pipe.—Aside from the routine business which has been rather encouraging of late, there is very little to be said about the pipe market in the west. A small lot of 150 tons was awarded to the United States Cast Iron Pipe & Foundry Co., at Woodstock, Ill. A Lynchburgh, Va., maker obtained a similar tonnage at Roanoke, Ill. Prices are fairly well maintained.

Merchant Pipe and Tubes.—Tube orders, which heretofore have held up very well against the general depression, now show considerable falling off. The demand for boiler tubes is especially light on account of the indifferent attitude of the railroads. Iron and steel house pipe is in fair demand in the immediate Chicago district. There is some talk of a readjustment of pipe prices in the near future.

Old Material.—At present no one seems prepared to say where the decline in scrap will stop. New low prices are quoted this week on No. 1 railroad wrought, arch bars and transoms, pipes and flues, No. 1 busheling and cast borings. A slowing down in the demand for iron bars has added another unfavorable feature to the scrap situation. A leading buyer recently refused an attractive tonnage of No. 1 busheling at $8.25, Chicago. The same purchaser bought a quantity of mixed borings and turnings at $4 net per ton. Among the railroad lists now pending are those from the Chicago, Milwaukee & St. Paul, the Union Pacific and the Chicago, St. Paul, Minneapolis & Omaha. The C., M. & St. P. list aggregates 2,600 tons, including 1,100 tons of No. 1 steel rails, on which bids will close Oct. 23. The C., St. P., M. & O. list aggregates 880 tons. In the Union Pacific offering, there are 600 tons at Omaha, 300 tons at Denver and 250 tons at Kansas City. The Omaha lot includes 150 tons of steel rails. Probably most of this material, as usual, will be absorbed by the Colorado Fuel & Iron Co.

Storms Delay Movement of Vessels

But Ore Shipments This Month Will Exceed 7,000,000 Tons—Extreme Dullness in Pig Iron and Finished Materials at Cleveland

BY GEORGE SMART

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, Oct. 28.

Iron Ore.—The week opened with storms sweeping the entire chain of lakes and interfering considerably with the movement of the fleet. The thermometer has fallen below the freezing point in the Lake Superior country and the storms in that region have been accompanied by flurries of snow. From now on the work of loading will be slow. Ore shippers have chartered a little tonnage for a few clean-up cargoes and are expecting to close the shipping season early. It is expected that they will dispense with outside tonnage during the first 10 days of November and will ship final cargoes well before the 30th. The November movement of ore will therefore be light, but the October movement will probably equal that of October of last year when 7,010,219 tons were moved.

Owing to the heavy weather, ore vessels are bunched at Lake Erie ports and the unloading machines will have all that they can do to clean up the waiting fleet by the latter part of the week.

Pig Iron.—Conditions which have prevailed for a number of weeks continue, with shipments to foundries heavy and with very little buying either for this year or the first half of next. Prices remain unchanged.

Coke.—The weakness in coke reported last week has not disappeared, but producers are not apparently as anxious to sell, and while it is believed that $2 can still be done on furnace coke for spot delivery, higher quotations are made for contracts. No transactions are reported. The foundry coke market is extremely quiet. Some sales of low phosphorus have been made at current prices.

Finished Material.—Rumors of a general reduction in prices of finished materials have subsided and the market is now drifting along without definite developments. In spite of the prompt deliveries being made by mills, warehouses are doing very fair business. All indications are that stocks in hands of consumers are low, and that if general conditions should improve, the demand for prompt delivery of all finished products will be strong.

The Detroit & Toledo Shore Line railroad has divided equally 1,000 tons of 80-pound standard steel rails between the Lackawanna Steel Co. and the Illinois Steel Co. The demand for light rails continues active. The Northern Ohio railroad has bought 750 kegs of spikes. There is cutting on the usual 1.65c price on spikes in western territory.

Old Materials.—The scrap market continued in its state of lethargy during the past week. Little business was done, actual transactions showing a downward trend. Heavy steel is still quoted $10.25 to $10.75; this is the lowest figure since 1897. At that time, however, melting steel did not play as prominent a part in steel making processes as it does now, and was little in demand. The leading steel mills of this district are practically out of the market at any price. The Youngstown Sheet & Tube Co., large consumer of wrought iron piling plate and arch bars, has not bought a tonnage of these grades for months, so prices on them quoted are nominal. Dealers claim to be near the dead line, saying they will hold their stocks for a rising market.

Harry Bialosky, 555 Leader-News building, Cleveland, advises that he has organized the firm of Bialosky & Co. to buy and sell iron and steel scrap, new light rails and old relaying rails. The firm of A. Rotter & Co., with which Mr. Bialosky has been connected, is being dissolved, and will make no purchases or sales. Mr. Bialosky states that he is retaining his half interest in A. Rotter & Co. until all accounts have been closed up properly.

Greatest Telescope.—The Canadian government recently ordered the largest telescope in the world to be used for observatory purposes, which, with equipment, will cost $90,000. The mechanical portion will be supplied by Warner & Swasey, Cleveland, and the optical part by the John A. Brashear Co., Pittsburgh. It will be of the reflecting type, the objective of which is a mirror of silvered glass of 72 inches diameter, which will be obtained in France. Its location, when completed, has not yet been definitely determined, but it will probably be mounted in Ottawa, in the neighborhood of the present observatory.

MODERATE SALES

And Firm Prices in the Birmingham Pig Iron Market.

BY W. B. NEAL

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., Oct. 21.

Pig Iron.—Inquiries have not been so numerous, but the price remains firm at $11.50 per ton for No. 2 foundry, Birmingham, for fourth or last quarter delivery, and $11.75 for first quarter of 1914. An inquiry for one car of No. 2 soft for immediate delivery was made of the several sales departments of the furnace interests and an acceptance of No. 1 soft in substitution was necessary to complete the sale, thereby showing the scarcity of iron for immediate delivery. It is estimated that 85 to 90 per cent of southern consumers are supplied in their requirements through the first quarter. This applies to the larger consumers, but the smaller interests have little raw material and will need tonnage continuously. The sales for the week aggregate 7,000 tons, of which 6,300 tons were entered in lots of carload and other tonnage lots up to 1,000 tons. This tonnage was entered by one producing interest, and was its entire output, less 700 tons. Special analysis iron amounting to 700 tons was also entered in carload and 100-ton lots. Some of the leading interests having sold well up, are not soliciting new business just now.

Cast Iron Pipe.—No new orders were ascertained as entered during the week just past, but all the plants are actively in operation and no curtailment has been shown. Some of the larger plants, it is understood, are supplied with orders that will require some time to fill, however, the shipments of most of the plants do not keep pace with production, hence accumulations of stocks is very apparent.

Old Material.—The market for old materials seems to have become as dull as it was some months past, but no change in prices has taken place. Inquiries are few and tonnage moving is largely that which was contracted some weeks past. The new business for the week does not involve exceeding 125 tons.

Southern Situation Not So Strong

As Viewed from Cincinnati, But Furnaces Are Holding Fast to Quotations—A Disturbing Rumor

BY S. G. BACKMAN

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, Oct. 21.

Pig Iron.—After another week of inactivity, the pig iron market shows no change as to prices, but it could probably be said that the situation as a whole is a little weaker. The principal development within the past few days has been brought about by a somewhat consistent, but unconfirmed rumor that a large Alabama furnace company is about to use most of its stacks for the manufacture of merchant foundry iron. This company at the present time is producing basic iron mostly for its own consumption. If this change should be made, it would probably weaken the southern foundry market accordingly, and even the effect of this rumor, although it is unconfirmed, has already been slightly felt. New inquiries are very scarce and usually for small tonnages, and in a number of cases are being sent out more with the intention of feeling the market than anything else. As a result, very few, if any, of the dealers here are doing a good business as far as new contracts are concerned. Shipments on old orders, though, appear to be going forward at a good rate, and it is doubtful if any of the furnaces, especially those in the south, are producing any more iron than they are shipping out.

Although its source is not known, there is some furnace iron being secretly offered from the south at $11 and $11.25, Birmingham basis, for last quarter shipment. All southern furnaces are quoting $11.50, Birmingham, for the last quarter, and from $11.50 to $12, Birmingham, for the first half of next year. We continue, therefore, to quote from $11 to $11.50, Birmingham, for No. 2 foundry iron for immediate shipment, and from $11.50 to $12, Birmingham, for the first half.

Southern Ohio iron is unchanged at $14, Ironton, for No. 2 foundry, for either the last quarter or first half of next year. The only sale of importance reported during the past week was for 500 tons of northern and southern foundry iron that was taken by a southern Indiana melter. This company was inquiring for from 2,000 to 4,000 tons of these same grades. A few sales of malleable iron, aggregating about 2,000 tons, have also been made for shipment outside of this territory.

Coke.—The coke market has probably lost a little of its strength during the past week, due principally to increased production and lack of transactions. Prices, however, have held at the same level for the past eight or ten days, although some of them recently suffered a slight decline, especially those for prompt shipment. Furnace coke appears to be a little weaker than foundry coke.

Finished Material.—While warehouse business has been rather good with most of the local houses during the past week, prices have nevertheless been reduced in most cases. Steel bars are now given at from 1.90c to 2c, iron bars at from 1.80c to 1.90c, plates and shapes at from 2c to 2.10c, and cold roll shafting at from 55 to 58 per cent off. Blue annealed, galvanized and black sheets are unchanged and are probably the strongest factors in the warehouse market here at the present time. Demand seems to be rather evenly distributed among all the articles carried in stock and the business being done is also about evenly divided between local and outside trade. One of the larger houses reports recent good sales of blue annealed sheets and light structurals. The reduction in prices is accredited to the fact that business has not been good enough recently to enable dealers to hold at their former quotations and also to the fact that adverse conditions in the kindred iron and steel markets have probably influenced the warehouse situation.

The local sheet mill has booked a fairly satisfactory tonnage recently and is now from six to eight weeks behind on deliveries. Specifications on both old and new contracts are very heavy, as buyers are anxious to get their requirements at this time of the year. Mill prices are unchanged at 2.20c on black sheets No. 28 gage and from 3.20c to 3.25c on galvanized sheets No. 28 gage, f. o. b. Newport (Ky.) and Cincinnati.

Old Material.—After another week of inactivity and a tendency toward a further decline in prices, the scrap market remains very uncertain and unsatisfactory. Dealers declare that in many cases they are being offered less for their iron than was the case last week, but they are very slow to make concessions, as they are not anxious to sell in certain instances, even at the present figures. The custom that has prevailed here for some time of determining prices more by the conditions of the sales than anything else is still being used in probably the majority of the present transactions. There does not seem to be any special demand for any certain grade of scrap carried here. Most of the sales at present are for outside of the city, as users of scrap here are only buying from hand to mouth, as it is actually needed. The surplus of scrap on hand or available is still greatly in excess of the consumption and a good buying movement that will last for a comparatively long time will be necessary to better this condition.

FEW CAR LOTS

Make Up the Business in the St. Louis District.

BY E. C. ERWIN

Office of THE IRON TRADE REVIEW,
St. Louis, Oct. 21.

Pig Iron.—Sales of pig iron last week were limited to a few car lots, and the inquiry today shows no improvement in conditions. Prices remain the same, with southern No. 2 at $11.50 for remainder of the year, and $12 for first quarter, as the basis. Demand for shipments on contracts, however, is very strong; several buyers having ordered all purchases for October sent forward before the month closes. Chicago iron is still quoted at $15, furnace, and Ironton at $14, furnace.

Coke.—There is no coke inquiry in the market, but demand for shipments on contracts continues good. Business is confined to car lots.

Old Material.—Scrap prices are unchanged, and business seems to have entirely ceased. No lists are out today.

Engineers Inspect Work.—A delegation of municipal engineers of New York City were guests of the Bethlehem Steel Co. on a tour of inspection of the company's mills at South Bethlehem, Oct. 17. The engineers were escorted through the various departments of the works by President E. G. Grace and other officials. The party from New York numbered about 300, and the trip to South Bethlehem was made by special train.

Pioneer furnace of the Cleveland-Cliffs Iron Co., Gladstone, Mich., is to be blown out and relined while idle. It has been in continuous operation for five years.

Mill Activity Decreases in the East

Output of Numerous Plants Being Gradually Reduced— Foreign Competition Does Not Promise to be Formidable

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
326 Real Estate Trust Bldg.,
Philadelphia, Oct. 21.

Shrinking order books are bringing into greater prominence the efforts of eastern finished steel makers to adjust their operations to a smaller market. The Eastern Steel Co. shut down its mills three days for repairs, while at Steelton, Ivy Rock, Coatesville, Bethlehem and other points mill capacities are gradually being curtailed. Steel works operations have been less affected. Finished prices show more raggedness and 1.30c, Pittsburgh, on shapes is indicated. Pig iron also is easier under lighter buying. Scrap is weak. Neither foreign iron nor steel is proving a strong competitor as further negotiations clarify the situation.

Pig Iron.—While no especial weakness has developed, the lighter buying is bringing an easier condition of the pig iron market in eastern Pennsylvania. Sales are now usually being made at minimum prices where a range of quotations has been well established and in some cases makers show a willingness to shade slightly to clinch an order. Northern No. 2X seems quotable at $15.75 to $16, Philadelphia, for this year, and this level might be shaded on certain brands. A Trenton buyer took 600 tons of 2 to 2.50 silicon iron for this year from northern makers at $15.35, delivered, or at $14.50 and slightly above at the selling furnaces. The Baldwin Locomotive Works asks 1,000 to 1,500 tons of its floor grades or about No. 2X quality for this year, and another inquiry for 1,000 tons of No. 2X is current. Virginia iron remains at $13 to $13.25, furnace, for No. 2X, with small sales. In low grade iron, a Schuylkill valley iron maker closed for 4,000 to 5,000 tons of standard forge at $15 to $15.25, delivered. This same buyer recently closed for a lot of southern forge. Pipe makers are buying odd lots around $15, delivered. Middlesbrough English iron is still considered 75 cents to $1 a ton too high for importation along the Delaware river. A local buyer has inquired tentatively for a cargo of 4,000 to 5,000 tons of Scotch hematite, equivalent practically to domestic Bessemer, and was quoted about $20, delivered, which is $2.50 or more above the price at which it can obtain eastern Bessemer. No effort has yet been made to import English hematite or low phosphorus grades. Domestic low phosphorus, standard quality, remains $23 to $23.50 with sales small. A small lot of Tennessee iron was done at the maximum basis. A sale of 1,000 tons of Lebanon low phosphorus at $18, furnace, is reported. Basic iron for this year is easier. Two buyers have taken about 3,000 tons at $15.25, delivered. Another buyer continues to offer $14.75, delivered, for several thousand tons with no takers. Another sale of 1,000 to 2,000 tons of basic for first quarter has been closed.

Iron and Steel Bars.—Importers are carefully investigating the chances for bringing in German rounds to meet the strong demand for the product for concrete purposes. In some cases as high as 1.75c, Philadelphia, is being obtained for prompt domestic bars of this character. Not much new business in steel bars is offered, but one eastern implement maker is inquiring for 600 tons and a lot of 1,000 tons for outside this district is up. The original bids having been repeated, the Concrete Steel Co. has finally been awarded the government order for 1,860 tons of deformed bars for Panama. Iron bars are no more active, but hold to the price range of about 1.25c to 1.35c, mill.

Plates.—There is a gradual shrinkage in eastern plate mill operations, although one maker reports its tonnage very well maintained. Universal plates are slow. Prices range from 1.50c to 1.55c, Philadelphia, or 1.35c to 1.40c, Pittsburgh, according to the size of the order. The Harlan & Hollingsworth Corporation has been awarded a ferry boat each for the Reading and Central Railroad of New Jersey, which will require 1,500 to 2,000 tons of steel. A steel dredge and a lighthouse tender awarded by the government to the Spedden Ship Building Co., Baltimore, will require 600 to 800 tons. The Reading and the Seaboard Air Line are in the market for plates and the Norfolk & Western is asking a round tonnage for new cars.

Structural Shapes.—Eastern shape makers are adjusting their operations to meet a much reduced market. The three rolling mills of the Eastern Steel Co., at Pittsburgh, were idle from Thursday night of last week until Tuesday of this week, having closed for repairs. The steel works activities were not affected. Other eastern makers show more slack in capacity and are cutting output. With makers generally in the east very anxious for orders, prices rule quite weak. The open market has become 1.50c, Philadelphia, or 1.35c, Pittsburgh, and it is indicated that this could be shaded $1 a ton in competition for a desirable tonnage.

Sheets.—A slower movement in eastern shapes continues. Prices are off $1 to $2. Eastern makers are now meeting 1.55c, Pittsburgh, or 1.70c, Philadelphia, for No. 10 gage blue annealed, though usually they quote 1.60c, Pittsburgh.

Semi-Finished Steel.—It is becoming apparent that eastern consumers of billets are willing to grant an advantage of $1 to $2 a ton to domestic makers, at least against German steel, by reason of differences in chemical analyses, standards, etc. It is known that two eastern buyers who were offered German billets at $22, or slightly above, Philadelphia, equivalent to $23 or more, delivered at the works, paid domestic makers around $25, delivered. One of these lots involved 2,000 tons of 4 x 4-inch billets and was taken by a Lebanon consumer who had been sounding out the foreign market for some weeks. A Richmond consumer who has been inquiring for 1,100 tons of small billets, has placed at least a trial lot of this order with German mills. It is reported that a Virginia ship builder has bought 2,500 tons of German steel, but this is not credited. Eastern makers continue to quote at $25, delivered, this district, for rolling billets, and $30, delivered, for forging steel.

Old Material.—Further weakness has developed in scrap material as lighter operation of eastern mills is diminishing the buying power. No consumer is now in the market for heavy melting steel, but brokers are offering $10.75 to $11.25, delivered. Sellers find difficulty to get more than $14, delivered, for No. 1 railroad wrought. Rerolling rails are selling at $14.50, delivered, about 1,000 tons being noted at this figure with some buyers offering only $14. Steel axles have stove plate, No. 1 forge and wrought sold at $17.50, delivered, and borings, pipe are lower.

The Locke Insulator Mfg. Co., Victor, N. Y., advises it is putting up an addition 72 x 160 feet, which is to contain a sherardizing shop and a hot-dip galvanizing plant. Equipment has been bought.

Consumers Order Prompt Shipments

In New York Territory, But Are Very Cautious as to the Future—Bolt Maker Refuses to Accept Offer of Foreign Steel

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
503-4 West St. Bldg.,
New York, Oct. 21.

Iron Ore.—Arrangements are being made to land at Philadelphia a second cargo of Texas ore from the operations of the East Texas Brown Ore Development Co. during the next several weeks. There remains an utter absence of buying in the market. Shipments of foreign ore are active, but merchants frequently are obliged to reconsign tonnages in order to place the full quantity received, since stock piles have grown considerably.

Pig Iron.—The urgent way in which consumers are ordering in their iron from the furnaces and anticipating shipments in some cases, is the most encouraging feature of an otherwise listless market. Despite any pressure from immediate needs, buyers show caution as to future covering and the sales list of the week is exceedingly spare; so much so that prices are uncertain, though they show signs of greater softness. It is indicated that No. 2 can be had from some makers around $15.50, tidewater, or 25 cents under the previous minimum. The New Jersey Zinc Co. closed for 500 tons of high and low silicon iron and is understood to have obtained the 2.75 to 3.25 silicon at about $15.50, delivered. A Dover, N. J., manufacturer of furnaces, who was expected to buy a round lot of foundry iron for delivery after Jan. 1, is holding off. A New Britain, Conn., interest in the market for 1,000 tons of No. 2X, states it is awaiting a price of $16, delivered. Despite some reports to the contrary, Buffalo iron seems to be holding at $14, furnace, for No. 2X. There have been no developments in this district in foreign iron.

Ferro-Alloys.—German ferro-manganese now is selling at $49 and $49.50, seaboard, sales of several hundred tons for prompt delivery at this price having been reported. At the same time, English makers have realized $50, seaboard, on some small early sales. There is no forward buying and the market is quiet. German ferro for forward shipment has been offered at $49, with no acceptances, as buyers, apparently, look for lower prices. An inquiry for 300 tons of spiegeleisen is current.

Plates.—Reports of 1.30c, Pittsburgh, having been quoted on plates by both eastern and Pittsburgh mills have come out of New England territory the past week. In this immediate district, while there is a suspicion that such a price could be done on a large order, no sales at this level have been established. Leading car builders are inclined to receive with conservatism reports of heavy equipment buying in sight and estimate total open inquiries about 10,000, including 3,000 for the Buffalo, Rochester & Pittsburgh, 2,000 cars for the Pittsburgh-Wabash Terminal railroad, and 500 car bodies for the Wabash railroad, 1,000 cars for the Wheeling & Lake Erie, 1,000 cars for the Toledo, St. Louis & Western, 400 for the Mobile & Ohio, and some scattering. The order placed by the Buffalo, Rochester & Pittsburgh with the Cambria Steel Co., is understood to have been 3,200 underframes.

Structural Material.—All eastern makers of structural material manifest a greater need of orders by the slowing-down of their mill operations. It is estimated that operations in the east now average not more than 50 to 60 per cent of capacity. New York City still is pretty quiet on new tonnage, and there is only moderate activity in any eastern districts. The open price in this market has been pretty well established at 1.51c, New York, or 1.35c, Pittsburgh, with some sales still going $1 higher. It is reported that an attractive tonnage probably could bring out a lower price than 1.35c, base.

Cast Iron Pipe.—Eastern pipe works now are operating at from 60 to 65 per cent of capacity and as order books decline various makers are offering such prices in instances as will assure their getting the order. This condition is causing considerable spread in prices. R. D. Wood & Co. submitted the lowest bid of $20.59, for the pipe and $55 for the specials on 6,600 tons of 30 and 48-inch specials for Atlantic City. The United States Cast Iron Pipe & Foundry Co., bid $20.90 for the pipe and $54 for the specials. These prices are equivalent to about $18.80 to $19 at the foundry for the pipe. R. D. Wood & Co. also are low at $21.82, delivered, on 1,270 tons of 8 to 12-inch pipe for Manhattan. A letting of 850 tons for Brooklyn, upon which John Fox & Co submitted the lowest bids some weeks ago, is readvertised for Oct. 24.

Iron and Steel Bars.—A bolt manufacturer in this district has been quoted German rounds at 1.27½c, delivered, or about 1.23c, New York, but has rejected the offer. Bolt makers express doubt over their ability to profitably use German or Belgian bars, because of difference in quality. German bars are also reported to have been offered at 1.23c, Boston. Steel bars remain quiet, but prices seem firm at 1.40c, Pittsburgh, in this district. Occasionally, makers receive cancellations from overstocked buyers. Iron bars are moving quietly. Mills in the metropolitan district will still do 1.25c, mill, but some eastern makers quote considerably higher.

Old Material.—Consumers are buying but sparingly and the market has weakened all along the line, with declines from 25 cents to $1 in different grades. Heavy melting steel in eastern Pennsylvania remains at about $11, delivered, with little buying by the mills. Cast scrap is enjoying the best activity in this district.

New Company Suggested

A new corporation with a capital stock of $15,000,000 has been suggested by the committee representing the security holders to draw up a plan for reorganizing the Southern Iron & Steel Co. The capital stock of the proposed new company is to be divided into $3,000,000 of 7 per cent first preferred both as to dividends and assets cumulative from Nov. 1, 1903, and redeemable at 110 per cent in accrued dividends; of $5,000,000 second preferred non-cumulative 6 per cent stock which takes priority both in dividends and assets over the common stock; and $7,500,000 par value of common stock. The proposed plan will provide $1,981,887, of which $1,000,000 has been underwritten. It has been suggested by some close to the affairs of the company that it will probably be known as the Gulf State Steel Co. Voting trust certificates representing stock of the new company are to be distributed and offered for sale to certificate holders.

The St. Louis Frog & Switch Co., St. Louis, has paid $17,000 for four acres in Wellston, a suburb, on which to build an addition to its plant, which is under construction now.

The new plant of the Washington Steel & Iron Co., Wenatchee, Wash., has been completed and is ready for operation. Tool steel is to be manufactured.

BUFFALO BUYERS

Are Still Hesitating—Canadian Market Improves.

BY FRANK R. DOLBEE

Office of THE IRON TRADE REVIEW,
Buffalo, Oct. 21.

Pig Iron.—The placement for the week, in all grades, did not amount to over 5,000 tons in a market that is practically listless and devoid of incident. Buyers continue to maintain a waiting attitude with reference to orders for future needs. The little business that did develop during the week came in from scattered consumers for small amounts to meet immediate needs. None of the limited inquiry remaining to be satisfied is for requirements beyond the end of the current quarter. Prices remain practically the same. The furnaces are holding to the schedule previously quoted. The only change noted is a slight stiffening in the price of malleable, based upon recent sales. It has advanced from $14 to $14.50, to $14.25 to $14.75.

Finished Material.—The principal activity of the week has been in specifications coming in on wire and wire products under contract. These have been accompanied by urgent requests for immediate deliveries, showing that jobbers' and consumers' stocks are low. While the market bears evidence of being a hesitating one, the limited placements made in the other lines, such as small shapes, bars and structurals, have also been followed up with urgent shipping instructions. It is evident that jobbers and manufacturers are keeping their stocks down to a low level where possible. No price changes have been noted during the week.

The Canadian market, instead of being a waiting, uncertain one, has taken on a note of decided optimism in the past few weeks. This is attributed to the improved financial situation there and also the amount of new construction, on a large scale, being undertaken by the provincial and municipal governments there. The new customs house at Ottawa to be built at once calls for about 2,500 tons of structural. The Collingwood Shipbuilding Co., Collingwood, Ont., was awarded the contract for a large steel lake freight steamer, taking a similar tonnage in shapes and plates.

Fabricators are busy getting out material under contract. Several of the local plants have all they need up to the first of February. They are holding prices at 1.40c, base, on structural for general orders, but a large and favorable offer of tonnage would bring a slight modification of this price.

Old Material.—Continued inactivity in the scrap market has caused a general softening of prices to take place with the opening of the current week. Only a limited number of transactions were reported and the majority of these were from consumers in the valley district. The local market is practically nil with the principal interest remaining out on heavy melting steel and other commodities in the line. It was the demand for material from the Pittsburgh section, at better prices than the ones previously quoted that caused the schedule to weaken in order to secure acceptances.

Breaks Building Record

The Mergenthaler Linotype Co.'s report for the year ended Sept. 30, 1913, gives the net income from all sources at $2,767,936, as against $2,738,522 in 1912, $2,733,269 in 1911 and $2,763,869 in 1910. In his report to stockholders President Phillip T. Dodge says:

"The number of machines built during the year was the largest in any one year of the company's life. There are now in existence in various parts of the world approximately 30,000 linotype machines. Continuing the policy which has existed from the beginning, experimental work has been carried on, with the result that numerous improvements and advances were made in the standard machines, and machines of new models were developed to meet the changing conditions of the art, the needs of the small offices and printers of limited capital, as well as the special requirements of many foreign languages."

Mesta Machine Co. Orders

The Mesta Machine Co. has received an order from Corrigan, McKinney & Co., Cleveland, for a 46 x 76 x 60-inch twin tandem compound reversing engine. The engine will be a duplicate of the one the company furnished the Youngstown Sheet & Tube Co., which was recently put into operation and has given excellent results. This engine differs from the usual type of compound reversing engines in the way of simplicity, that is, the valve gear is less complicated than in the usual type of reversing engines. The throttle and links are cotrolled by a single lever, which greatly reduces the steam consumption and gives the operator better control of the engine. The two bed plates of this engine will weigh over 100 tons each.

Other orders received by the Mesta Machine Co. include the following: From the Bethlehem Steel Co., for a complete 22-inch bar mill, including shears, tables, etc.; also from the Imperial Steel Works of Japan, No. 5 heavy type roll turning lathe; from M. A. Hanna & Co., for putting new air ends on two of their blast furnace blowing engines. These air ends will be equipped with the Mesta Machine Co.'s new patented automatic valves.

Shows Larger Earnings

The annual report of the Pullman Co., Chicago, for the year ended July 31, 1913, shows net income of $19,870,206, equal to 16.56 per cent on the $120,000,000 stock before charging out depreciation, as compared with 14.41 per cent on the same stock in the previous year. There was a balance after dividends of $1,541,602, against $828,998. The income account compares as follows:

	1913.	1912.
Total revenues	$42.860,891	$40,219,174
Operating expenses	22,633,918	22,608,178
Deprec. on cars	8,729,098	6,859,098
Assoc. int.	356,766	324 014
Total deduct.	31,719,782	29,791,290
Bal. for div.	11,141,109	10,428,458
Dividends	9,599,506	9,599,460
Surplus	1,541,601	828,998
Prev. surplus	2,884,382	2 055,383
Total surp.	4,425,983	2,884,382

The balance sheet shows total assets and liabilities of $168,543,772, against $150,885,991 in the previous year.

METAL MARKETS

Chicago

Oct. 20.

New Metals.—Cash prices for copper delivered to actual consumers show practically no change. Spelter quotations have been trimmed extensively during the past 10 days, the minimum now being 5.20c, Chicago; lead is declining in sympathy. Tin is about stationary and is not much in demand in the west.

We quote dealers' selling prices f. o. b. Chicago as follows:

Lake copper, carload lots, 16½c; casting, 16⅜c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 5.20c; lead, desilverized, 4.25c; sheet zinc, $7.50, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 41c; Cookson's antimony, 8½c; other grades, 7½c.

Old Metals.—Zinc and lead scrap are under pressure; copper is steady. The volume of business shows practically no change. There is considerable hand to mouth buying by the brass foundries.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 14½c; copper bottoms, 12¼c; heavy red brass, 13¼c; heavy yellow brass, 8½c; No. 1 red brass borings, 11¼c; No. 1 yellow brass borings, 8c; brass clippings, 10c; lead pipe, 4¼c; zinc scrap, 4⅜c; tea lead, 4c; No. 1 aluminum 16½c; No. 1 pewter, 28c; block tin pipe, 36½c; tin foil, 32c; linotype dross, 3¼c; electrotype dross, 3¼c; stereotype plates, 4⅝c; stereotype dross, 3¼c.

MORE RAILROAD INTEREST

But Doubt As to Heavy Buying of Cars in the Near Future.

The display of some increase of interest in equipment needs seems to be the leading development on the railroad side of the iron and steel market. Some additional cars have been placed and there are more active inquiries before builders, but builders generally are not inclined to believe any heavy movement will come during the next few months. They estimate about 10,000 cars in an active stage. The Norfolk & Western railroad is inquiring for 10,000 to 15,000 tons of steel for 500 to 1,000 hoppers to be built in its own shops. Some bridge and structural work has been placed in the east and a round tonnage still is pending. Another section of the New York subway requiring about 9,000 tons is offered for bids.

Rail sales are coming more slowly. A report that the New York Central has deferred its order until after Jan. 1, is not credited. Spike prices are easy, standards being offered at 1.60c, Pittsburgh, and lower is reported to have been done by some eastern makers. The Detroit & Toledo Shore Line has divided 1,000 tons between the Illinois and Lackawanna Steel companies.

In the west there has been a slight revival of activity in the car market, but the amount of equipment now pending is not sufficient to keep the plants in the Chicago and East St. Louis district operating at capacity for more than 30 days.

The rail order of the Australian Trans-Continental railroad, upon which American makers were invited to submit bids, has been distributed, 27,000 tons going to Bolckow, Vaughan & Co., Middlesbrough, Eng.; 17,000 tons to the Lithgow Works, Australia, and 10,000 tons was withdrawn.

The East Indian Railway has placed about 10,000 tons with Guest, Keen & Nettlefields, an English maker.

CARS AND LOCOMOTIVES.

The Wabash system is in the market for 500 car bodies to be fitted to old trucks.

The Chicago, Burlington & Quincy is still in the market for 500 steel cars.

The Southern Railway is inquiring for 500 steel hopper cars.

The Missouri Pacific is inquiring for 100 all steel passenger cars.

The Chicago & Western Indiana R. R. has ordered 10 locomotives from the Lima Locomotive Corporation, Lima, O.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered six consolidation locomotives and four Pacific type locomotives from the American Locomotive Co.

The Buffalo, Rochester & Pittsburgh has ordered 3,600 underframes from the Cambria Steel Co.

The Buffalo, Rochester & Pittsburgh is negotiating for 3,000 steel cars.

The Southern railway is in the market for 500 steel cars.

The San Pedro, Los Angeles & Salt Lake railroad has ordered three locomotives from the Baldwin Locomotive Works.

The Minneapolis, St. Paul & Sault Ste. Marie railroad has placed four Pacific and six consolidation locomotives with the American Locomotive Co.

The Central Railway of Brazil has placed six locomotives with the American Locomotive Co.

The Dorado Extension railway of Columbia has ordered two Pacific type locomotives of the American Locomotive Co.

The Lakeside & Marblehead railroad has ordered one switching locomotive of the American Locomotive Co.

The New Orleans, Great Northern railroad has ordered one ten-wheel locomotive from the American Locomotive Co.

The Baldwin Locomotive Works is understood to have taken an order for 38 locomotives from a western system.

The Elkins Coal & Coke Co. is inquiring for 200 hopper cars and this order is expected to go to the Pressed Steel Car Co.

BRIDGE AND STRUCTURAL WORK.

Lehigh Valley railroad bridge work, Buffalo, 1,350 tons. Awarded Lackawanna Bridge Co.

Delaware, Lackawanna & Western railroad, 6,500 tons of bridge work at Buffalo; understood to lie between Fort Pitt Bridge Works and American Bridge Co.

Section No. 5 of the Seventh avenue subway, New York City, 3,200 tons; closes Nov. 12. Section 3, 5,700 tons; closes Nov. 5.

STRUCTURAL CONTRACTS

Are Being Made Very Slowly—Sharp Competition Among Erectors.

Structural awards in the eastern district during the past week have aggregated about 5,000 tons, which is a little better than during the several weeks preceding. Pending tonnage is of fair quantity, but contracts still are coming slowly. The dullness in the immediate metropolitan district which has prevailed for some time still is unbroken.

Structural lettings in the west show some improvement, but the aggregate volume of business still leaves much to be desired. On any important job fabricators are cutting prices to the limit. The railroads have cleaned up practically all of their structural business for the time being.

Fabricators in the Pittsburgh district have experienced a decidedly dull week, one of the quietest in almost a year. Several interesting projects are under consideration, but promoters do not appear anxious to close negotiations. It is not probable much, if any activity will be noted until the general situation becomes more certain. Except for an order for several large oil tanks, involving 1,200 tons, taken by the Riter-Conley Mfg. Co., no contracts of interest are reported.

STRUCTURAL CONTRACTS PLACED.

Dexter building, Boston, 550 tons, awarded New England Structural Co.

Building for New York Telephone Co., Albany, 2,200 tons; steel work awarded to Levering & Gerrigues.

Post office, New Haven, Conn., 900 tons; steel understood will be placed by contractor with Levering & Gerrigues.

The Aetna Life Insurance Co., Hartford, Conn., 800 tons, awarded to Levering & Gerrigues.

Bank building, Delancy street, New York City, for the Marcus Holding Co., 300 tons, awarded to Ravitch Bros.

Yale Club House, New York City, about 3,000 tons, general contract awarded to Marc Eidlitz & Sons. Steel expected to go to American Bridge Co.

Public schools 170 and 179, Brooklyn, 700 tons. General contract placed with the McKeon Construction Co.

City of Los Angeles, aqueduct pipe line, southern California, aggregating 2,815 tons; 2,543 tons to Lacy Mfg. Co. and 272 tons to Llewellyn Iron Works.

Lake county, Ind., Scherzer rolling lift bridge, Dickey Place, Lake county, Ind., 338 tons to the Toledo Bridge & Crane Co.

Seven 55,000 barrel oil tanks, for the Penn Mex Fuel Co., Pittsburgh, 1,200 tons, the Riter-Conley Mfg. Co. Tanks will be erected in the Tampico district, Mexico.

Church of Latter Day Saints, Salt Lake City, Utah, office building, Salt Lake City, Utah, 573 tons, to the American Bridge Co.

The Penn Bridge Co., Beaver Falls, Pa., has received a contract for fabricating 2,500 tons of lock gates for improving the waterway connecting Puget Sound with Lake Union and Lake Washington, near Seattle, Wash., from the United States government.

CONTRACTS PENDING.

Smelter for American Smelting & Refining Co. in Alaska, 2,000 tons; bids asked.

Bank building, Charleston, W. Va., 900 tons, bids taken.

Coaling station for the United States government at Pearl Harbor, Hawaii, 2,000 tons. Bids to be received Nov. 1.

Building for R. G. Dun & Co., Brooklyn, 500 tons. Revised figures being taken.

Binghamton high school, Binghamton, N. Y., 900 tons. Bids extended to Oct. 29.

Employes of the Tennessee Coal, Iron & Railroad Co. have forwarded to Congressman Underwood a petition weighing 24 pounds, containing the names of 13,000 employes of various departments, almost unanimous, asking that the government suit against the United States Steel Corporation for dissolution be dropped.

Grading for the plant of the Standard Seamless Tube Co. at Ambridge, Pa., the plant to be erected by Fownes Brothers, Pittsburgh, is under way and construction will be started in the spring.

President C. M. Schwab, of the Bethlehem Steel Corporation, returned to this country Oct. 22, after a several weeks' business trip abroad.

COTTON TIE SHORTAGE

Responsible for Price — Interesting Governmental Report.

Washington, Oct. 21.—The shortage of the supply of cotton ties is ascribed as the reason for the advance in prices in a report of the Department of Commerce submitted to the senate. It was made as the result of a resolution introduced by Senator Smith, of South Carolina, last summer, requesting that such investigation be made into the cotton tie and cotton bagging situation. It was alleged that makers of both products had combined to increase the price.

The report, submitted by Secretary Redfield, of the Department, completely negatives that charge insofar as it relates to cotton ties.

The report, a strikingly thorough one, dealing with the most minute detail of the cotton tie industry, says that concerns manufacturing ties claim there is more money in making the other types of hoops and bands, with the result that there is a shortage. President A. C. Dinkey, of the Carnegie Steel Co., is credited with saying that it makes a larger profit on other types of hoops, but that someone has to make cotton ties and that, though there is now a shortage, it expects before the end of the season to make enough to fill the requirement of the year's crop.

The ordinary cotton crop now averages about 12,000,000 bales and for this year there are needed 72,000,000 ties or 2,400,000 bundles, while the record crop of about 16,000,000 bales required some 96,000,000 ties or 3,200,000 bundles.

The concerns making cotton ties in the United States, together with their ordinary annual output, are given as follows:

	Bundles.
Carnegie Steel Co., Pittsburgh.....	1,500,000
Pittsburgh Steel Co., Pittsburgh....	300,000
Sharon Steel Hoop Co., Sharon, Pa.	100,000
Atlanta Steel Hoop Co., Atlanta, Ga.	300,000
Connors-Weyman Co., Helena, Ala..	150,000

It is estimated that ordinarily there are used some 300,000 bundles of second-hand ties that are sold by cotton mills, and these, with the output of new ties, make up the bundles ordinarily required.

As is generally known, cotton ties were free-listed.

Touching upon the tariff feature of the situation, the report says:

"It is not probable that a high duty or no duty at all, will make the slightest difference in the imports of ties, for the distance from the foreign mills and the low cost of manufacture in American steel mills practically prohibit competition unless the prices are pushed up to a much higher level than has yet prevailed."

Imports of ties into the United States are declared to be entirely negligible, and to justify the statement there is submitted a table denoting the imports for the past few years.

The Carnegie Steel Co.'s annual capacity for making ties is given at some 1,900,000 bundles, which is the amount it expects to make this year. The capacity of the Pittsburgh Steel and Sharon Steel Hoop companies is placed at 400,000, but they are making no cotton ties this year, the report says. Their failure to manufacture is given as the cause for the deficit in the supply. This shortage, however, it is pointed out, will be made up partly by an increased output by the Carnegie Steel Co., and the two southern companies, and partly, probably, by a much larger use of second-hand ties.

The prices per bundle for the years 1911-1913, inclusive, are given, showing the record price to have been 95c in 1907, while the price this year, 80c, is referred to as a normal one.

The Carnegie Steel Co. is credited with saying the price at which products are selling this year in the south is not due to the primary price, but to the fact of a shortage of a supply on account of the failure of the Pittsburgh and Sharon companies to manufacture ties this year and that southern jobbers are using the temporary shortage to boost their prices and to make excess profit for handling.

One independent dealer is quoted as saying that the high price is due to the Carnegie company holding back manufacture of ties until late in the season and thus keeping from the foreign market the prices at which it intended to sell. The report, however, gives only passing notice to this statement and it is the evident belief of the investigators that the shortage alone is the cause of the prices being what they are.

That this position is taken is apparent from the following sentence in the report:

"There has been a marked shortage of ties this year, and this fact more than any other has caused the prevailing high price."

F. E. Myers & Bro., Ashland, O., advise their 60 x 160-foot addition of four stories is to be used for office and storage purposes and no machinery equipment will be needed.

The Premier Metal Etching Co., New York City, advises its damage in a recent fire was about $6,000, fully insured. Machinery was not seriously damaged.

MANY MORE PROTEST

Against Dissolution—Employes Would Like to Appear.

Washington, Oct. 21.—Signed by something over 13,000 employes of the United States Steel Corporation, additional petitions requesting that the government withdraw its dissolution suit against the Corporation have been received in the house of representatives and turned over to the department of justice.

Employes to the number of about 13,000, engaged by the Tennessee Coal, Iron & Railroad Co., forwarded a petition which was submitted by Majority Leader Underwood, while another with 400 signers came from employes of the American Sheet & Tin Plate Co.

Both petitions are similar to those previously presented, pointing out the satisfactory working conditions, and wages paid by the Corporation, and expressing the belief that dissolution of the Corporation would work injury both to the employes and the Corporation.

A letter sent from the New Castle, Pa., works of the Corporation and signed by a committee of three, D. S. Williams, Thomas R. Lewis and Albert J. Russell, has been received by Attorney General McReynolds. It is set forth in the letter that the committee represents all of the employes of the works and request is made that the committee be allowed to appear personally in Washington to give testimony. The committee says the testimony given before the Stanley investigating committee of the house was one-sided and that the employes would like to give oral testimony to present their views, which are favorable to the Corporation.

The department has received letters stating the entire movement is a measure of coercion adopted by the Corporation. Coming from a reliable source, there is reason for the firm belief that the department gives no credence whatever to the charge, and further, that it is outside of the issue. It is also held that the petitions can have no bearing on the suit in that the only question involved is as to whether the Corporation is violating the Sherman anti-trust law.

Armand Alexandre, formerly connected with the Chicago office of the Ohio Iron & Metal Co., has embarked in business for himself with offices at 1925 People's Gas building. He will conduct a brokerage business in scrap iron and steel.

OPTIMISTIC VIEW

Of Tariff Changes Taken by Crucible Steel in Year's Report.

"During the year a change in congressional representatives has brought about a determination on the part of the majority to reduce import duties on most of the manufactures of this country, including the lines of steels produced by your company. Just what permanent effects such reductions will have on this company's earnings, it is yet too early to foresee, but we are fully prepared to meet such new conditions when they shall arise," says Herbert DuPuy, chairman of the executive committee, and C. C. Ramsey, president of the Crucible Steel Co. of America, Pittsburgh, in the 13th annual report. No further reference is made to the new tariff in the report, but it is apparent officers of the company regard the future from an optimistic viewpoint.

The report, considered the best in the history of the company, contains the following:

Earnings by quarters:—	
First	$1,795,121.09
Second	2,001,938.82
Third	1,641,873.47
Fourth	1,519,197.12
Total	$6,958,130.50
Deduct charges and appropriations:—	
Repairs	$1,033,163.54
Depreciations	665,000.00
Contingencies	53 595.36
Interest on subsidiary bonds	300,485.81
	$2,052,244.71
Net profits	$4,905,885.79

The net profits applicable to dividends, $4,905,885.79, are equivalent to 19.62 per cent on the preferred stock, compared with 13.70 per cent for the previous year, an increase of 5.92 per cent. The undivided surplus is $8,106,162.54, compared with $4,950,276.75.

Work on the Midland plant of the Pittsburgh Crucible Steel Co., a subsidiary, has been delayed somewhat, but the open-hearth department was started Aug. 4 and the finishing mills are expected to follow soon. It is expected the completed works there will be second to none in the world in plan and conception. The blast furnace at this works has been in steady operation more than seven years, "showing greater life and endurance than has been shown by any blast furnace in this country and its condition still is such that it may continue to produce uninterruptedly for several years without relining".

Encouragement of employes in Midland has resulted in many homes being built along the lines laid down by the company in its improvement work and the city of Midland is assuming the appearance of a model town.

Completion of a dam in the Ohio river opposite the Midland plant, will provide slack-water transportation for coal from the company's mines, a distance of 100 miles, and provide cheap fuel throughout the year. The fleet of 50 wooden barges and a steamboat has been added to by 22 steel barges and a second steamboat. An addition of 2,500 acres of coal land has been made.

Completion of improvements at the Atha works has been delayed, but it is expected the electric furnace there will be started in December and produce great savings in the cost of some products. The plant of the Syracuse Crucible Steel Co. is proceeding and the buildings will be completed in the spring of 1914 and the remainder of the year will be occupied in erecting machinery. The company expects this to be the most up-to-date crucible steel producer in the world.

The report states the preferred stock is held by 3,194 stockholders and the common stock by 1,870, making a total of 5,064 persons interested in the business.

Set Dates for Hearings

Several cases before the Interstate Commerce Commission of interest to the iron and steel trade have just been set for hearing.

The case of the Pittsburgh Steel Co. against the Pittsburgh & Lake Erie, et al., involving rates on semi-finished and finished products from the Pittsburgh district, has been set for Nov. 17 at Pittsburgh, before Commissioner Meyer.

Rehearing in the case of the Wickwire Steel Co., the Buffalo Union Furnace Co., the Tonawanda Iron & Steel Co., the New York State Steel Co., and the Lackawanna Steel Co., against the New York Central & Hudson River Railroad Co., et al., will be held before Commissioner Meyer at Buffalo, on Nov. 19. The case involves coke rates from the Connellsville region to the Buffalo district. In a recent decision the commission held that the rate of $1.85 per ton on coke between those points was not unreasonable, and the complainants asked for and were granted a rehearing.

The cases of the Newport Mining Co., the Hays Mining Co., and Corrigan, McKinney & Co., relating to transportation charges on ore from mines to vessels and dock charges, will be continued at Washington, Oct. 28, before Special Examiner Settle.

BRITISH STOCKS

Still are Declining—Same Number of Furnaces Active.

New York, Oct. 22.—Stocks of pig iron in the Middlesbrough and Cumberland districts of England, continue steadily to decline. In the week of Oct. 9, Middlesbrough stocks were 168,474 tons, a decrease in the week of 2,374 tons, and in the year to date of 73,149 tons. A sharp decline was shown in the Cumberland district, where stocks of Oct. 9 fell off 3,069 tons, bringing them upon that date to 13,899 tons, a decline in the year to date of 22,524 tons. The number of furnaces blowing in the Middlesbrough district on Oct. 9, was 81, the same as the week preceding, and in the Cumberland district, 25, which also was the same as the week of Oct. 2.

A summary of the stock conditions in the Middlesbrough and Cumberland district in recent weeks with the number of furnaces blowing shows the following:

MIDDLESBROUGH DISTRICT.

	Stocks.	Furnaces.
Oct. 9	168,474	81
Oct. 2	170,848	81
Sept. 25	171,887	83
Sept. 18	175,803	85
Sept. 11	179,360	88
Sept. 4	183,140	89
Aug. 28	187,269	..
Jan. 1	241,623	..

CUMBERLAND DISTRICT.

Oct. 9	13,899	25
Oct. 2	16,968	25
Sept. 25	17,720	25
Sept. 18	18,181	24
Sept. 11	18 829	24
Sept. 4	19,601	24
Aug. 28	19,761	..
Jan. 1	36,423	..

George Evans Dies at Butte, Mont.

George David Evans, for many years a salesman of the Republic Iron & Steel Co. and the Carnegie Steel Co., died suddenly at Butte, Mont., Oct. 17. Mr. Evans was 34 years of age, and for a number of years was a salesman traveling from the Cleveland office of the Republic Iron & Steel Co. In 1910, he became connected with the Carnegie Steel Co., at Denver, and during the past summer was transferred to Salt Lake City, where he was in charge of the office of the company. He had for years been a sufferer from tuberculosis of the spine (Pott's disease), but enjoyed fairly good health in recent years and his death was entirely unexpected. The funeral was held in Cleveland on Oct. 22.

The plant of the Wheeling Sheet & Tin Plate Co., Yorkville, O., will be ready to operate Nov. 1. The machinery is all at the plant and part is installed.

SAFETY CAMPAIGN

Inaugurated at a Banquet by a Wisconsin Company.

An elaborate safety campaign has been put under way by the J. I. Case Threshing Machine Co., of Racine, Wis., which is about to open its new South Works, erected at a cost of $1,500,000 and offering employment to 1,000 to 1,500 additional employes about Jan. 1. The officers tendered a banquet to heads of departments, superintendents, foremen and assistants, 250 in number, and outlined the campaign. J. D. Beck, member of the Industrial Commission of Wisconsin, and C. W. Price, safety expert for the commission, made addresses. The work will be carried out by means of a Safety Club in which employer and employe will have an equal share of responsibility and interest. It was brought out at the banquet that while 33 per cent of all accident prevention has been accomplished by means of mechanical guards on machinery, 67 per cent results from educational work. The Case company has an elaborate system of safeguarding machinery and will devote much of the expense and labor of safety work to education of employes to bring the mechanical safeguards to the highest point of efficiency attainable.

What Compensation Costs in Wisconsin

The Industrial Commission of Wisconsin reported on Oct. 17 that since the workmen's compensation act went into effect two years ago, 5,075 cases have had final jurisdiction under the law and employers in Wisconsin have paid out $288,126.83 as indemnity to injured workmen or their dependents or heirs. The average paid to each injured employe was $56.78. In addition there has been a considerable expenditure for medical, surgical and hospital treatment, the aggregate cost of which cannot be accurately determined. It is estimated, however, that at least 50 per cent of the amount paid for indemnity would equal the cost of medical services to employes. On this basis, the actual cost to employers of Wisconsin to compensate 5,075 workmen for personal injury in two years has been $432,190.24.

The industrial commission of Wisconsin has made a fixed rule that in the future no deputy in the free employment service may accept employment with a private corporation experiencing labor troubles or with any private employment agency for a period of six months after leaving the service of the state. The rule was brought about by the action of E. N. Phelps, superintendent of the state free employment bureau at Superior, Wis., in resigning to accept a position as head of a private employment agency recently established by the Calumet & Hecla Copper Mining Co. in the Michigan district. The company has been experiencing serious labor troubles. The Wisconsin commission sees in this action the application of expert knowledge gained in the state service for private benefit and desires to prevent similar steps in the future.

Favor More Battleships

Washington, Oct. 20.—That the president and Secretary Daniels, of the navy department, have strong support in the senate committee on naval affairs should they finally decide to urge a greater navy program calling for two or three new battleships a year, seems apparent. It has been persistently reported that both the president and secretary are favorable to a three-battleship program.

Senator Tillman, chairman of this committee, when asked his opinion regarding the suggested naval program, said that he did not consider it the duty of the chairmen of the senate and house committees to formulate policies. He said that he thought it the duty of the president and his administration, but indicated strongly that he would support the policy of the president.

Senator O'Gorman said he had discussed with the president the need for a program which looked to a greater navy, and had found the president favorable to such a program.

Greater Efficiency Demanded

New York, Oct. 22. (By wire.)—The National Machine Tool Builders' Association today opened its twelfth annual convention at the Hotel Astor. President E. H. Bullard Jr., in his opening address, said there is general feeling that the machinery builders must meet the reduction in the tariff by an increase in efficiency. Improved tool steels, he said, will afford one means. The meeting will continue until Friday.

Award Delayed.—Delay in awarding the contract for the Lincoln Memorial, to be erected in Potomac Park, Washington, probably will be occasioned because of disputes of bidders who claim their figures were not given the consideration they should have received and also because of the question as to whether it is the duty of the president of the Memorial commission or of the Secretary of War to make the award. The Attorney General has the matter under consideration.

Diamond State Steel Co. Affairs

Representatives of the United States Railway Steel Tie Co., of Pittsburgh, have been offering securities in that company in exchange for holdings in the defunct plant of the Diamond State Steel Co. at Wilmington, Del. Some of the members of the syndicate of bondholders and stockholders which bought in the property at receiver's sale in 1906 have accepted the proposition; others have not. The plant, consisting of open-hearth furnaces and rolling mills, is to be offered at public sale Oct. 22, by order of the courts. The Steel Tie company is expected to make some effort to get control of the works, and bids will also be submitted by scrap merchants who plan to dismantle the plant. The Diamond State Steel Co. has not been operated since 1903.

Favor Tunnel Under Hudson

The announcement is made that the special commission which has been studying since 1906 the problem of connecting the states of New York and New Jersey by bridge or tunnel across the Hudson river has determined to recommend the tunnel type of construction. This decision has been influenced by the great disparity in the respective cost of the two plans. It is estimated that a two-tube tunnel, each with a roadway 17 feet wide to accommodate vehicles, can be built at a cost of about $11,000,000. A bridge of equal traffic capacity, it is figured, would entail an outlay of about $50,000,000. The capacity of the tunnels is figured at 5,000,000 vehicles per year.

Charles P. Carlson, 68 years old, for many years employed in the McKeesport (Pa.) mills of the National Tube Co., died last week at that city. For a number of years before he retired from active service, about 12 years ago, he acted as one of the boss rollers.

John R. Maclay, aged 67, connected with the Westinghouse interests for more than two score years, died in his home at Edgewood, Pa., last week. He was one of the organizers of the Westinghouse Veteran Employes' Association.

BROKEN TIRE

Responsible For Wreck on Big Four —Cause of Thermal Cracks.

Washington, Oct. 21.—The report of H. W. Belnap, chief inspector of safety appliances of the Interstate Commerce Commission regarding the investigation of a derailment on the Cleveland, Cincinnati, Chicago & St. Louis railway, near Stockwell, Ind., on Jan. 7, 1913, accompanied by the report of James E. Howard, engineer-physicist of the bureau of standards, was made public today.

The accident was due to a broken tire. Referring to the broken tire, Mr. Howard says:

"The character of the fracture was such that while it is believed to have been the extension of a thermal crack previously existing in the tire, its development by stresses in the track and complete separation would take place very promptly when the final stage was reached. The shrinkage of the tire upon the wheel center was the chief element of strength or resistance which kept it in place when intact. When fractured this resistance was lost, and only the strength of the rivets of the retaining rings would then be available for holding it in place. Successive side lurches of the car, common to all train movements, overcame the strength of the rivets by flange blows, ultimately forcing the tire off the wheel center."

In discussing the cause of thermal cracks, Mr. Howard points out that the tires are placed on wheel center under shrinkage strains reported to range from 1/80 to 1/60 inch per foot of diameter; but shrinkage strains are variable factors, Inspector Belnap says, under service conditions; they change as the tire becomes worn and cold rolling of the metal at the tread has a tendency to modify the strains.

Mr. Howard further says that:

"The greatest factor in the case, however, is the application of the brakes. The tread is suddenly heated by the friction of the brake shoe and the tire expanded before the center is affected, no doubt causing wide fluctuations in the magnitude of the shrinkage strains. Momentarily the tire may be left with very little resistance when there is a sudden application of the brakes. . . . But the sudden heating of the treads of wheels and the attainment of high temperature assumes a more serious aspect than causing the temporary reduction of shrinkage resistance. Thermal cracks in the steel are formed in this manner, the presence of which is a menace to the integrity of the tire. . . . They are caused by the rapid cooling of the intensely heated metal where free contraction is resisted."

In the tread of the tire which caused this accident there were a number of thermal cracks which are described in detail.

Mr. Howard also says:

"Methods of inspection may need revision to meet current conditions of railway service, wherein is shown a marked tendency to increase the working stresses, and in so doing decrease the margin in strength remaining between them and rupturing loads of the materials. Inspection for the discovery of occasional structural defects and inspection for noting approach to the limit of endurance of materials are quite distinct problems, the latter presenting great difficulties. High-wheel loads and the introduction of high-speed brakes are factors in the present case."

It is stated by Inspector Belnap that a diligent inspection of the car wheels in this train would have disclosed the presence of thermal cracks.

"The presence of cracks of this character on tne tread of a tire," says Mr. Belnap, "is a menace to safety and is sufficient reason for taking a wheel out of service. To avoid further accidents of this nature, more thorough examinations of car wheels should be made."

During the five-year period, 1908-1912, Mr. Belnap reports, there were a total of 32,323 derailments from all causes, and of this total 14,563, or approximately 45 per cent, were due to defective equipment. Of the number due to defective equipment 5,222, or approximately 36 per cent, were due to defective wheels. The number of derailments due to defective wheels was approximately 16 per cent of the total number of derailments from all causes that occurred during this five-year period.

Will Make Steel by Electricity

The first electric steel furnace to turn out castings commercially in Canada is yielding about two tons a day. It has resulted from several years' experimenting by James A. Moffatt and T. C. Irving Jr., graduates of McGill University, who have constructed a furnace in Toronto capable of turning out seven tons a day, claimed to be superior to crucible steel. A company has been formed, known as the Moffatt-Irving Electric Smelters, Ltd., to establish a much larger plant in Toronto. According to tests at the University of Toronto, the steel has an ultimate tensile strength of from 75,000 to 90,000 pounds per square inch and is absolutely free from gases, thus gaining in uniform density. James B. O'Brien, K. C., is president of the company.

Ends a Prosperous Year

In celebration of the completion of the first year under the present management, H. B. Richmond and G. W. Schueppert, principal owners of the Merrill Iron Works, Merrill, Wis., gave a banquet to department heads, salesmen and every member of the operating department, from apprentice to skilled laborer at the Hotel Badger, in Merrill, last week. Since Messrs. Richmond and Schueppert took charge of the company's affairs a year ago, the volume of business has been increased more than ten-fold and new territory was recently invaded which has already brought so much additional business that the works are unable to take care of it all.

Varied Views on Price Prospects

New York, Oct 22. (By wire.)—It is believed in well-informed quarters that some revision of tin plate prices may be made around Nov. 1, when many leading buyers usually enter for requirements after Jan. 1. The general opinion is that prices will probably be reduced several dollars. Persistent talk continues of cut in steel pipe prices scheduled for about Nov. 17, but it is believed in some quarters that there will be no reduction prior to Jan. 1.

Companies Consolidated

The Hecla Iron Works, of Brooklyn, and the Winslow Bros. Co., of Chicago, have effected a consolidation of their interests under the name of the Hecla-Winslow Co., Inc., and will continue in the manufacture and fabrication of ornamental ore and bronze work for buildings. The present plants in Brooklyn and Chicago will continue to be operated and managed as in the past. The Hecla division in New York is to cover the eastern territory and that of the Winslow Bros. in Chicago will give its attention to the territory west of and including Pittsburgh. The Hecla Iron Works, of New York, was established in 1876, and the Winslow Bros., of Chicago, in 1885. The new company has just completed its organization.

The Cerrytree Iron Works, Barnesboro, Pa., partly destroyed by fire several months ago, is being rebuilt. It is being enlarged as it is rebuilt.

IRON AND STEEL PRICES

Pig Iron

PITTSBURGH,

(Through This Year.)

Bessemer	$16.65
Basic	14.90
No. 2 foundry	14.65 to 14.90
Malleable	15.15 to 15.40
Gray forge	14.40

(The freight from valley points is 90c.)

CLEVELAND

(Through This Year Delivered in City.)

No. 1 foundry	$15.00 to 15.50
No. 2 foundry	14.75 to 15.00
No. 2 southern	15.10 to 15.35
Bessemer	16.65
Silveries, 8 per cent silicon	18.55 to 19.05

CINCINNATI

(Fourth and First Quarters.)

Southern foundry No. 1	$14.75 to 15.25
Southern foundry No. 2	14.25 to 14.75
Southern foundry No. 3	13.75 to 14.25
Southern foundry No. 4	13.50 to 14.00
Southern gray forge	13.25 to 13.75
Mottled	13.25 to 13.50
Southern No. 1 soft	15.25
Southern No. 2 soft	14.75
Standard southern car wheels	27.25 to 27.75
Southern Ohio No. 2	15.20
Southern Ohio No. 3	14.70
Southern Ohio No. 4	14.45
Silveries, 8 per cent silicon	18.20 to 18.70

(Freight from Ironton, $1.20; from Birmingham, $3.25.)

CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.)

Lake Superior char., No. 1 to 4	$15.75
Northern foundry No. 2	15.00
Southern foundry No. 2	15.85
Jackson Co. silveries, 8 per cent	19.40
South'n silveries. 5 per cent sil.	17.35
Alabama basic	15.85
Malleable	15.00

PHILADELPHIA

(Prompt and third quarter shipment delivered to consumers' plants, in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	$16.00 to 16.25
Northern No. 2X foundry	15.75 to 16.00
Northern No. 2 plain	15.50 to 15.75
Standard forge (Eastern Pa.)	15.00 to 15.25
Virginia No. 2X	15.80 to 16.05
Southern No. 2	15.00 to 15.50
Standard low phos., Phila.	23.00 to 23.50
Lebanon low phos., furnace	17.50 to 18.00
Malleable	16.75 to 17.00
Basic (Eastern and Central Pa.)	15.25 to 15.50
Middlesbrough, English No. 3 (on docks)	15.00 to 15.25

NEW YORK

(Prompt and third quarter delivery, prices based at Jersey City and tidewater.)

Northern No. 1X foundry	$16.00 to 16.25
Northern No. 2X foundry	15.50 to 16.00
Northern No. 2 plain	15.25 to 15.50
Virginia No. 2X	16.10 to 16.35
Southern No. 2	15.25 to 15.75
Malleable	15.75 to 16.00
Gray forge	14.75 to 15.00

ST. LOUIS

(Throughout This Year.)

Southern No. 1	$15.75 to 16.25
Southern No. 2	15.25 to 15.75
Southern No. 3	14.75 to 15.25
Southern No. 4	14.25 to 14.75

(Freight, Birmingham to St. Louis, $3.75.)

BIRMINGHAM

(For southern delivery.)

No. 1 foundry	$12.00 to 12.50
No. 2 foundry	11.50 to 12.00
No. 3 foundry	11.25 to 11.75
No. 4 foundry	11.00 to 11.50
Gray forge	11.00 to 11.50
Mottled	10.25
Standard basic	11.50
Off basic	11.00
Charcoal	25.00

BUFFALO

(Through this year, delivered in city.)

No. 1 foundry	$14.25 to 15.00
No. 2X foundry	14.00 to 14.50
No. 2 plain	14.00
No. 3 foundry	13.75 to 14.00
Gray forge	13.75
Malleable	14.25 to 14.75
Basic	14.50 to 14.75
Charcoal	15.50 to 16.50
Charcoal (special brands)	17.00 to 19.50

Ferro Alloys

English and German 80 per cent ferro-manganese, prompt and forward delivery, $49 to $50, seaboard.

Fifty per cent ferro-silicon on contracts, $75, Pittsburgh, or Philadelphia, for carloads; $74 for larger lots and $73 for 600 tons or more. Twelve to 13 per cent, $24. Eleven to 12 per cent, $23. Ten to 11 per cent, $22. Nine to 10 per cent, $21, f. o. b. Globe, Jisco and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 to 30 cents higher, respectively.

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Denver	84½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents

Coke

AT THE OVENS.

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$2.75 to 3.00	$2.75 to 3.00
Furnace coke	2.00 to 2.25	2.15 to 2.25
Wise county district:—		
Foundry coke	$2.75 to 3.50	$2.75 to 3.50
Furnace coke	2.25 to 2.50	2.35 to 2.50
Pocahontas district:—		
Foundry coke	$2.85 to 3.00	$2.85 to 3.00
Furnace coke	2.20 to 2.40	2.35 to 2.75
New River district:—		
Foundry coke	$3.25 to 3.50	$3.25 to 3.50
Furnace coke	2.60 to 2.75	2.60 to 2.90

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, prices are: Old range Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi, non-Bessemer, $3.40; al at lower lake ports.

Foreign iron ores. 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania furnace points range from 35 to 75 cents per ton.

Semi-Finished Material

PITTSBURGH

Bessemer 4 x 4 billets with 0.25 carbon and less, $23.00 to $23.50; open-hearth rolling billets, $23.00 to $23.50; Bessemer sheet bars, $23.50 to $24.00; open-hearth sheet bars $23.50 to $24.00, f. o. b. Pittsburgh and Youngstown. Forging billets, $28, Pittsburgh. Wire rods, $27.00; muck bar, $30, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity; 4 x 4-inch open-hearth and Bessemer rolling billets at $25 to $26, and forging billets at from $30 to $31; muck bar, $28 to $30.

Standard Shapes

PITTSBURGH

Standard structural shapes, 1.35c to 1.45c, For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.58c to 1.63c.

PHILADELPHIA

Standard structural shapes, base sizes, delivered to consumers' plants in Philadelphia and vicinity, 1.50c to 1.55c.

NEW YORK

Standard structural shapes base sizes, delivered in metropolitan district, 1.51c to 1.56c.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¾ to 100 inches, 1.35c to 1.40c. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inches thick, 6⅝ to 100 inches wide, 1.53c to 1.58c.

PHILADELPHIA

Tank plates, base sizes, delivered to consumers' plants in Philadelphia and vicinity, 1.50c to 1.55c.

NEW YORK

Tank plates, base sizes, delivered in the metropolitan district, 1.51c to 1.56c.

Sheets and Tin Plate

PITTSBURGH

No. 28 black	2.00c to 2.10c
No. 30 tin mill black	2.10c to 2.20c
No. 28 galvanized	3.05c to 3.15c
No. 10 blue annealed	1.55c to 1.60c
No. 28 painted, corrugated	2.20c to 2.30c
No. 28 galvanized, corrugated	3.10c to 3.20c
Tin plate, 100-pound cokes	3.50c to 3.60c

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.80c.

Pipe and Boiler Tubes

PITTSBURGH

	Black Butt.	Galv. Weld.
Steel, ¾ to 3 inches	80	71½
Iron, ¾ to 2½ inches	70	61

BOILER TUBES

Steel, 3½ to 4½ inches	69	..
Iron, 3½ to 4½ inches	58	..

Other sizes of pipe and tubes take the usual advances as per official cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.35c for open-hearth, carload lots; less than 500 tons 1.35c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c. base, Pittsburgh; track bolts, 2.40c base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.65c.

CHICAGO

Light rails, carloads, 25 to 45-pound, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21.50 to $22.50; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings, f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.70c; smaller size spikes, 1.85c base; track bolts with square nuts, 2.20c to 2.25c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.50c to 1.55c. Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops, in carload lots, 1.60c, Pittsburgh; in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 to 62 per cent off in carloads and 55 to 57 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron, 1.25c to 1.30c, hard steel bars rerolled, 1.45c; soft steel bars, bands and small shapes, 1.53c to 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 60 per cent off list for carload lots, 55 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars, 1.55c to 1.60c on contract and common bar iron, 1.32½c to 1.42½c. Cut nails, 1.80c to 1.90c. Philadelphia. Shafting 62 and 60 off in carloads and 57 and 55 off in less than carloads in base territory.

NEW YORK

Soft steel bars delivered in the metropolitan district, 1.56c; common iron bars, 1.32c to 1.45c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 1.90c, Pittsburgh, cone head boiler rivets, 2.00c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 1.95c to 2.00c; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, small and shorter, rolled threads, 75 and 10; cut threads, 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ¾ x 4 inches, smaller and shorter, rolled 75, 10 and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ⅜-inch and larger, $6.60 off; ⅓-inch and smaller, $7.20 off.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, $1.60; retailers' carload lots, $1.65; cut nails (western makers), jobbers' lot, $1.65; painted barb wire jobbers' carload lots, $1.69; retailers' carload lots, $1.60; plain wire to jobbers in carloads, $1.40; and to dealers in carloads, $1.45; polished staples, $1.60; galvanized staples, $2.00.

CHICAGO

Wire nails, jobbers' carload lots, $1.83; retailers' carload lots, $1.85; retailers' less than carload lots, $1.93; painted barb wire, jobbers' carload lots, $1.83; retailers' carload lots, $1.88; retailers' less than carload lots, $1.93; with 40c for galvanizing; plain wire, jobbers' carload lots, $1.63; retailers' carload lots, $1.68.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, $27; 6 to 12 inches, $26; larger sizes, $24; gas pipe, $1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, $23 to $24, f. o. b. New York, in carload lots.

BIRMINGHAM

Water mains: 4-inch, $22.00; 6-inch and up, $21.00. Gas main: $1 per ton higher than water main. Special fittings, $47.50 to $52.50.

Old Material

PITTSBURGH

(Gross Tons Delivered.)

Heavy melting scrap	$12.00 to 12.50
Rerolling rails	13.50 to 14.00
Malleable	11.50 to 12.00
Bundled sheet scrap	7.75 to 8.25
Iron axles	24.50 to 25.00
Old iron rails	14.50 to 15.00
Stove plate	9.00 to 9.25
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.75 to 13.00
Low phosphorus	14.75 to 15.25
Machine shop turnings	7.00 to 7.25
No. 1 busheling	10.50 to 11.00
Cast borings	8.00 to 8.25
No. 1 cast scrap	12.25 to 12.50

PHILADELPHIA

Gross tons delivered to consumers' plants, in eastern Pennsylvania and western New Jersey:

Old iron rails (nominal)	$16.00 to 16.50
Old iron rails (rerolling)	14.00 to 14.50
No. 1 heavy melting steel	11.00 to 11.50
Old car wheels	12.50 to 13.00
Old iron axles	25.00 to 26.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Wrought pipe	10.75 to 11.25
Cast borings	7.75 to 8.00
Machine shop turnings	7.50 to 8.00
Heavy cast (broken)	13.00 to 13.50
Malleable	11.50 to 12.00
Stove plate	10.00 to 10.50
No. 1 forge	9.00 to 9.50
Low phosphorus	15.00 to 15.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg, and Steelton, Pa.; $1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Old iron rails	$12.50
Old steel rails (under 3 ft.)	12.00 to 12.50
Old steel rails (over 6 ft.)	11.75 to 12.00
Relaying rails	23.00 to 25.00
Old steel boiler plate	8.50 to 9.00
Malleable iron (railroad)	11.00 to 11.50
Axle turnings	6.50 to 7.00
Steel axles	16.50 to 17.00
Malleable iron (agricultural)	8.50 to 9.00
Heavy steel	10.25 to 10.75
Country mixed steel	8.50 to 9.00
Bundled sheet scrap	6.50 to 7.00

Net Tons

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling (nominal)	8.50 to 9.00
No. 1 machine cast	10.75 to 11.25
No. 1 dealers' wrought	8.00 to 8.50
Machine shop turnings	4.00 to 4.50
Pipes and flues	7.50 to 8.00
Wrought drillings	4.00 to 4.50
Cast borings	5.00 to 5.50
Stove plate	8.00 to 8.25
Wrought iron arch bars (nom.)	13.00
Wrought iron piling plate (nom.)	13.00

CHICAGO

(Delivered in consumers' yards.)

Gross Tons

Old car wheels	$12.00 to 12.50
Old iron rails	13.75 to 14.25
Rerolling rails (5 ft. and over)	12.00 to 12.50
Old steel rails (3 ft. and und.)	11.25 to 11.75
Frogs, switches and guards	10.50 to 11.00
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

Net Tons

No. 1 R. R. wrought	$9.50 to 10.00
No. 2 R. R. wrought	8.50 to 9.00
Arch bars and transoms	12.75 to 13.25
Knuckles, couplers and springs	10.75 to 11.25
Shafting	14.25 to 14.75
Iron car axles	20.25 to 20.75
Steel car axles	14.50 to 15.00
Locomotive tires	11.75 to 12.25
Dealers' forge	8.50 to 9.00
Pipe and flues	7.25 to 7.75
No. 1 cast	10.75 to 11.25
No. 1 busheling	7.75 to 8.25
No. 2 busheling	6.25 to 6.75
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.00 to 12.50
Cast borings	5.00 to 5.25
Machine shop turnings	4.50 to 5.00
Railroad malleable	10.50 to 11.00
Agricultural malleable	10.00 to 10.50
Angle bars, splices, etc., iron	13.00 to 13.50
Angle bars, steel	9.00 to 9.50
Stove plate and light cast scrap	8.75 to 9.25

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for eastern Pennsylvania delivery:

Old car wheels (nominal)	$10.50 to 11.00
Heavy steel axles	15.25 to 15.50
Steel shafting	13.50 to 14.00
No. 1 heavy melting steel	8.75 to 9.00
No. 1 R. R. wrought	11.75 to 12.00
Wrought pipe (not galvanized)	8.75 to 9.00
Cast borings	6.00 to 6.50
Machine shop turnings (nominal)	5.50 to 6.00
Heavy cast	10.50 to 11.00

Stove plate	7.50 to 8.00
Grate bars	6.50 to 7.00

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50; from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

CINCINNATI

Gross Tons

Old iron rails	$11.00 to 11.50
Old steel re-rolling	9.50 to 10.00
Old iron axles	15.50 to 16.00
Heavy melting scrap	8.50 to 9.00
Relaying rails	18.50 to 19.00

Net Tons

Old No. 1 R. R. wrough	$ 8.50 to 9.00
Bundled sheet scrap	4.50 to 5.00
No. 1 yard wrought	6.50 to 7.00
No. 1 machine cast	9.00 to 9.50
No. 1 busheling	6.50 to 7.00
Stove plate	6.25 to 6.75
Machine shop turnings	4.50 to 5.00
Cast borings	4.00 to 5.00
Heavy turnings	5.00 to 5.50
Mixed cast	7.50 to 8.00
Breakage	5.00 to 6.00
Malleable	6.50 to 7.00

BIRMINGHAM

Old iron axles (light)	$15.00 to 15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.50 to 11.00
No. 1 steel scrap	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Tram car wheels	10.50 to 11.00
Light cast and stove plate	9.00 to 9.25

BUFFALO

Gross Tons

Heavy melting steel	$10.25 to 10.75
No. 1 R. R. wrought scrap	12.50 to 13.00
No. 1 R. R. and mch. cast scrap	12.00 to 12.50
Old steel axles	17.00 to 17.50
Old iron axles	22.50 to 23.00
Car wheels	12.00 to 12.50
Railroad malleable scrap	11.50 to 12.00
Machine turnings	5.75 to 6.25
Heavy axle turnings	8.00 to 8.75
Cast iron borings	5.75 to 6.25
Low phos. steel scrap	16.50 to 17.00
Old iron rails	15.00 to 15.50
Boiler plate sheared	12.00 to 12.50
Bundled sheet scrap	7.00 to 7.50
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	9.50 to 10.00
No. 1 busheling scrap	10.00 to 10.50
No. 2 busheling scrap	7.50 to 8.00
Wrought pipe	8.50 to 9.00

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels	$10.75 to 11.25
Old iron rails	11.50 to 12.00
Re-rolling rails (5 ft. and over)	11.00 to 11.50
Old steel rails (3 ft. and und.)	9.50 to 10.00
Light sec. relayers (45 pounds and und.) subject to inspec.	23.50 to 24.00
Relaying rails, subject to inspec.	23.50 to 24.00
Frogs, switches and guards	9.00 to 9.50
Shoveling steel	8.50 to 9.00

Net Tons

No. 1 railroad wrought	$9.50 to 10.00
No. 2 railroad wrought	9.00 to 9.50
Arch bars and transoms	12.50 to 13.00
Knuckles, couplers, springs	8.50 to 9.00
Shafting	13.00 to 13.50
Steel car axles	14.50 to 15.00
Iron car axles	17.50 to 18.00
Locomotive tires	10.50 to 11.00
Pipe and flues	6.50 to 7.00
Tank iron and cut boilers	6.50 to 7.00
No. 1 cut busheling	8.50 to 9.00
Cast iron borings	3.50 to 4.00
Machine shop turnings	4.50 to 5.00
Railroad malleable	8.00 to 8.50
Agricultural malleable	6.50 to 7.00
Stove plates	7.50 to 8.00
Angle splice bars (iron)	10.50 to 11.00
Angle splice bars (steel)	8.50 to 9.00

Store Prices

CINCINNATI

Steel bars, 1.90c to 2c; iron bars, 1.80c to 1.90c; plates and shapes, 2c to 2.10c; sheets, blue annealed No. 10, 2.15c to 2.20c, black, No. 28, 2.65c; galvanized, No. 28, 3.75c; cold rolled shafting, round, square, hexagon and flat, 55 to 58 off.

CLEVELAND

Steel bars, 2.00c; plates and shapes, 2.10c; iron bars, 2.00c; sheets, No. 16 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

CHICAGO

Steel bars, 1.85c; iron bars, 1.85c; hoops, 2.50c; shapes and plates, 1.95c; No. 10 blue annealed sheets, 2.15c, black, No. 28, 2.75c; galvanized, No. 28, 3.80c.

PHILADELPHIA

Steel bars, 1.85c to 1.90c; structural shapes, 2.00c; plates, 2.00c.

NEW YORK

Steel bars, 2.00c; structural shapes, 2.05c; plates, 2.05c.

More Tonnage for Subway

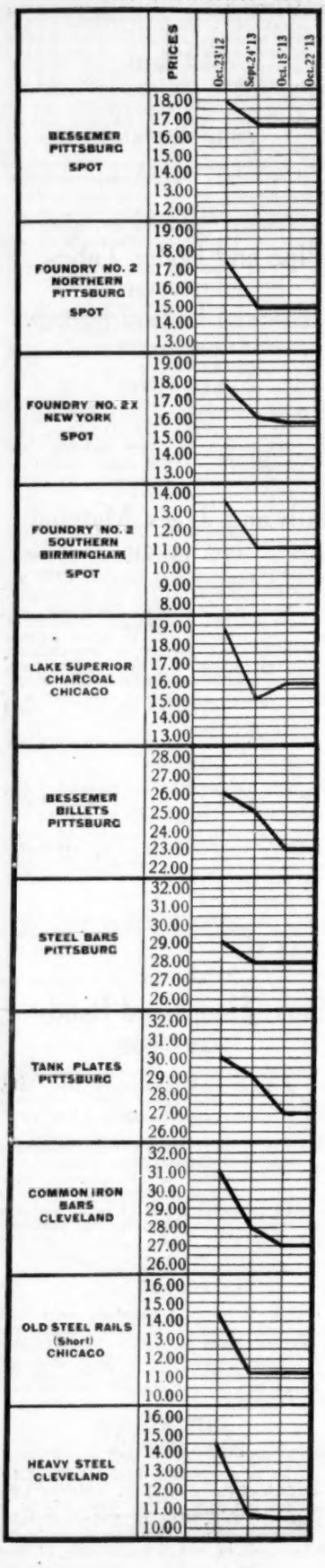
New York, Oct. 22. (By wire.)—Another section of subway and elevated extension in Brooklyn was offered today for bids Nov. 18. This makes four sections now open, including one upon which bids are closed. The total steel of these sections is about 20,000 tons. A report from Chicago that the American Bridge Co. has the steel for the new Baldwin Locomotive shops in that district is not officially confirmed. This matter is not settled, though eventually the steel may go to the American Bridge Co. About 5,000 tons are involved.

Steel parts for automobiles will be stamped by a new company, the Transue Drop Forging Co., Alliance, O., which has bought the plant of the Devies-Bach Mfg. Co., at Alliance. O. F. Transue, Alliance, is head of the company and capital from Alliance, Cleveland and Detroit is interested. Machinery for larger fabrications will be installed.

The Riter-Conley Mfg. Co., Pittsburgh, advises it has taken a contract from the Huasteca Petroleum Co., Los Angeles, for two standard 35,000 barrel oil tanks, with a tonnage of 300. Also a contract from the Penn-Mex Fuel Co., Pittsburgh, for two 55,000-barrel oil tanks, tonnage 300, to be erected in the Panuca district, Tampico, Mex.

Mathias Saxman, 77 years old, of East Latrobe, Pa., died last week. He was one of the pioneer coal operators in that section of the state, and was one of the first to operate coke ovens in the Latrobe field.

PRICE CHART



Foundrymen Discuss Many Problems at Chicago

(Continued from page 728)

A tentative scheme of classification suggested by Mr. Karr follows:

Bronze:—A copper-tin binary alloy with copper as the chief component.

Brass:—A copper-zinc binary alloy with copper as the chief component.

Composition:—An alloy of two or more metals with copper as the chief component.

White metal alloys:—A binary combination of any two white metals.

White metal composition:—A binary alloy of two white metals combined with one or more other variable minor components, such as Britannia, pewters, fusible metals and soft solders.

Anti-friction and bearing metals may be divided into two or three classes, according to their composition. The white bearing or anti-friction metals are all either white metal alloys or compositions, all others are either brasses or bronzes or their corresponding compositions.

Noble metal alloys:—Binary combinations of the noble metals.

Noble metal compositions:—Binary alloys of the noble metals in combination with one or more other noble or base metals as minor components.

Amalgams:—Alloys of mercury with various metals.

Special alloys:—Alloys known by distinctive names, yet by their composition may be placed in one of the above groups.

Trade names:—Alloys whose names are trademarked, yet may be classified in one of the above groups if their composition be known.

Binary alloys:—Exclusive of bronze and brass, they may be placed in a class by themselves, the chief constituent forming the qualifying title, such as cupro-vanadium, cupro-tungsten, etc.

All of the so-called nickel silver alloys may be classified as cupro-nickel alloys or compositions, according to the number of constituents they possess.

A few examples may be cited to illustrate the application of the above tentative classification with some agreements and conflict with present day practice.

Gun bronze, or 90 per cent copper and 10 per cent tin, is a true bronze.

Government metal, or 88 per cent copper, 10 per cent tin and 2 per cent zinc, is a bronze composition.

Muntz metal, or 60 per cent copper and 40 per cent zinc, is a true brass, known in the trade as a yellow brass.

Red metal, or 70 per cent copper, 20 per cent zinc, 6 per cent lead and 4 per cent tin, is a brass composition.

Bell metal, or 80 per cent copper and 20 per cent tin, is a true bronze.

Arsenic bronze, or 69.20 to 82.20 per cent copper, 10 per cent tin and 7 per cent lead, with traces or perceptible increments of arsenic, is a bearing metal and might be classed as a bronze composition.

Commercial rod-brass, or 60 to 63 per cent copper, not more than 3 per cent lead and the balance zinc, might be called a brass composition.

Plastic bronze, or copper 69 per cent, tin 10 per cent, lead 21 per cent. is a bearing metal and might be called a lead composition.

Monel metal, or 67 per cent nickel, 27 per cent copper and 6 per cent of other metals, although known to the trade by no other name, might be called a nickel-copper composition.

Naval brass, or 59 to 63 per cent copper, 0.5 to 1.5 per cent tin, 0.02 to 1 per cent lead, 0.06 per cent iron and the balance zinc, may be called a brass composition.

Manganese bronze, so-called, is composed of 57 to 60 per cent copper, 0.5 per cent tin, 37 to 40 per cent zinc, iron not to exceed 1 per cent and 0.3 per cent manganese and sometimes contains aluminum.

Phosphor bronze is an alloy of copper and tin with generally less than 1 per cent of phosphorus. There is now serious objection to this name.

Aluminum bronze is an alloy of copper and aluminum in variable proportions.

Pyrometer for Brass

A progress report of the co-operative work of the Bureau of Mines with the American Institute of Metals was presented, which particularly related to the development of a suitable pyrometer for molten brass and of an electric furnace for melting brass. H. W. Gillett stated that while no suitable pyrometer yet has been developed, it is probable that the work now under way will lead to the design of an instrument of this kind, which not only will enable the foundrymen to obtain accurate measurements of temperatures, but also may be cheaply applied in daily foundry work. The investigations that have been conducted for the purpose of developing an electric furnace for brass melting do not indicate an immediate satisfactory conclusion of the efforts that are being made to develop such a melting medium during the year. H. W. Gillett also compiled a report covering a comparative study of brass furnaces with particular reference to fuel efficiency and losses of metal in melting. More than 300 sets of data on the performance of 21 distinctive types of furnaces in commercial use were compiled from information received from 280 firms in 28 states and from 75 foundries and rolling mills in 11 states. The subject of health and safety of workers in brass foundries also will be discussed and a bulletin that has been prepared by Mr. Gillett, covering these subjects, will shortly be available.

A report of the work done at the laboratory of the Bureau of Standards at Pittsburgh on non-ferrous alloys this year was presented by C. P. Karr. The work thus far has been confined to one alloy, consisting of copper, 88 per cent; tin, 10 per cent, and zinc, 2 per cent. The tests decided upon are to determine the best form of test block and test piece. The castings are poured in green sand and in dry sand in accordance with recommendations of the Society of Automobile Engineers. For determining the best form of test block and test piece, the alloy will be cast at various temperatures, to determine the best casting temperature. The following tests will be made on all of the bars: Tensile, elongation, reduction of area, stress-strain curve, compression and microstructure. In addition, tests were made to ascertain heat and electrical conductivity, shrinkage, coefficient of expansion, tensile properties up to 800 degrees Fahr., erosion by steam, corrosion by sea water and fresh water, hardness, shearing, specific gravity, impact, fatigue, etc.

A symposium of papers on scientific management of brass foundry operations was considered at one meeting, which included discussions of this subject by W. M. Corse, of the Lumen Bearing Co., Buffalo, by C. B. Bohn, general superintendent of the Aluminum Castings Co., Cleveland, and by E. A. Barnes, general superintendent of the Fort Wayne Electric Works, Fort Wayne Ind. Mr. Corse stated that before scientific management can be introduced into any brass plant, the conditions in the plant should be standardized so that the proper method of wage payment can be adopted. C. B. Bohn stated that scientific management has resulted satisfactorily in the operations of the various plants of the Aluminum Castings Co., and while this science is not a cure-all, nevertheless he added that the company is satisfied with the work already accomplished. E. A. Barnes pointed out that the subject of efficiency relative to the operation of brass foundries now is receiving the attention and support of foundry managers, and directed attention to the method pursued by the Fort Wayne Electric Works to standardize its methods of operations. The discussion was unusually interesting and many foundry foremen and superintendents pointed out that the methods which they have pursued to increase output resulted in a proportionate higher wage for their employes. The consensus of opinion was that when once the molders are assured that a piecework price will not be reduced as a result of greater output, they will support any innovations that will insure more efficient operations.

Use of Producer Gas

"The Application of Producer Gas to Brass Foundry Work," by E. F. Buhlmahn, discussed the subject of economical fuel with special reference to melting in the brass foundry industry. Since the recent action of the oil companies in withdrawing fuel oil from the market, the procuring of a definite supply of fuel has been given considerable consideration, and in one plant a gas producer has been installed with considerable success. By recovering the sensible heat of the waste gases from the furnaces and preheating the incoming gas or air, or both, a high temperature may be ob-

tained with a proportionate high degree of economy. Preheating reduces the cost of installation by reducing the plant capacity, due to the decreased gas consumption, and also permits the use of lower pressures of gas and air.

Other papers presented and discussed follow: "Commercial Operation of the Hering Electric Furnace", by G. H. Clamer; "Silver Plating and Spotting-Out", by C. F. Burgess; "Fluxes for Soft Solders", by W. Arthur, and "Approximate Melting Points of Some Commercial Alloys", by A. B. Norton and H. W. Gillett.

Election of Institute Officers

Officers for the ensuing year were elected as follows:

President—G. H. Clamer, Ajax Metal Co., Philadelphia.

Secretary—W. M. Corse—Lumen Bearing Co., Buffalo.

Vice Presidents—Rolling mills, W. H. Bassett, American Brass Co., Waterbury, Conn.; Michigan and Ohio, F. O. Clements, National Cash Register Co., Dayton, O.; Ontario and Western Canada, C. H. Ivey, Empire Mfg. Co., London, Ont.; Quebec, Robert Job, Milton-Hersey & Co., Montreal; Pennsylvania, Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; New England, Dr. E. Weintraub, General Electric Co., West Lynn, Mass.; Chicago and Wisconsin, Fred Moerl, Pullman Co., Chicago; Illinois except Chicago, Phillip Mueller, H. Mueller Mfg. Co., Decatur, Ill.; New York and New Jersey, C. A. Finnegan, Empire Smelting Co., Depew, N. Y.; Virginia and the South, E. S. Fretz, Light Foundry & Mfg Co., Pottstown, Pa.

Associated Foundry Foremen

A large number of the Associated Foundry Foremen were registered at the Chicago convention. The annual meeting of this organization took place Wednesday evening, Oct. 15. S. V. Blair, of the Kalamazoo Stove Co., Kalamazoo, Mich., was unanimously elected president and H. M. Martin, of the Davis Foundry Co., Hornell, N. Y., vice president. Robert B. Thompson, of the Buffalo-Pitts Co., Buffalo, was re-elected secretary-treasurer. The proceedings of the meeting, aside from the election, were entirely informal. Various phases of foundry practice were discussed.

Entertainment Features

The local committee at Chicago tendered the visiting foundrymen an enjoyable entertainment program containing a number of novel features. At the La Salle hotel headquarters a buffet luncheon was served on Tuesday, followed by a special matinee at the La Salle opera house. On this occasion a musical comedy entitled "A Trip to Washington" was presented. The stage was specially decorated in the first act with foundry tools and implements. On Thursday evening a large crowd enjoyed the annual subscription dinner at the Congress hotel. This banquet was somewhat unusual in that there were no set speeches, the entire evening being given over to a special vaudeville performance. Before the matinee on Tuesday the ladies were given a souvenir luncheon at the Marshall Field tea rooms, and on Thursday evening attended a performance of "The Lady of the Slipper" at the Illinois theater. Mrs. Henry E. Pridmore, assisted by Mrs. F. S. Wayne, Mrs. Charles Dahlgren, Mrs. H. Cole Estep, Mrs. O. J. Abell and Mrs. Henry A. Pridmore, constituted the ladies' reception committee. Charles A. Plamondon, president of the A. Plamondon Mfg. Co., was chairman of the Chicago Foundry Convention Committee. Associated with him on the general committee were David R. Forgan, treasurer; H. Cole Estep, secretary; J. A. Galligan, O. J. Abell, C. B. Carter and William Francis. By special arrangement, practically all of the important shops and plants in Chicago and vicinity were open to visitors throughout the week.

Texas Ore of Good Quality

Arrangements are now being made to prepare a second cargo of iron ore for shipment to Philadelphia from the operations of the East Texas Brown Ore Development Co., in Cass county, Texas. The first cargo of this ore was delivered to the Alan Wood Iron & Steel Co., at Philadelphia, several weeks ago. An analysis of this cargo just made public by B. Nicoll & Co., New York City, who are handling the marketing of this material, shows an ore of good quality. This analysis, made by Andrew S. McCreath & Son, Harrisburg, Pa., shows that the ore on being dried at 212 degrees Fahr. lost 2.146 per cent and contained dried at this temperature the following elements:

Iron	57.45
Silica	4.460
Alumina	2.377
Manganese	0.170
Sulphur	0.103
Phosphorus	0.100

Arrangements are being gradually made by the East Texas Brown Ore Development Co. to extend its mining and shipping facilities as the market for its output, which is chiefly in the eastern district, warrants the expenditure.

Good Relining Record

No. 3 blast furnace, 450 tons capacity, of the Algoma Steel Corporation, Sault Ste. Marie, Canada, was blown out for relining at 2:45 a. m., Sept. 14, 1913. The top of the furnace was removed to be remodeled while an old lining was being taken out. The brick work was started at 9 a. m., Sept. 21, and completed at 4 a. m., Oct. 4. The time drying was 8½ days. The blast was put on at 2:35 p. m., Oct. 15. The total time was 31 days, 11 hours and 50 minutes. This furnace was in blast from April 15, 1911, to Sept. 14, 1913, and is 90 feet high and 21 feet 6 inches at the bosh.

Blast Furnaces and One Day of Rest

When the New York legislature passed the one day in seven rest day bill last winter, it gave the industrial board power to suspend its operation when necessary for the preservation of property, life or health. In accordance with this provision the Northern Iron Co. and the Tonawanda Iron & Steel Co., operating blast furnaces, appealed to the board for a permanent exemption from the rest day law.

The industrial board denied the application in this public statement:

"The industrial board's decision was based on its belief that it was the intent and purpose of the law to grant exemptions from the one day rest in seven provision only in cases of emergency which could not be anticipated in the statute itself, and that the clear intent of the law is not to exempt industries in continuous operation, or to give the industrial board power to suspend the operation of the law, except where an emergency occurred which could not be anticipated by the managers of the industry and the failure to exempt would cause serious loss to property, life or danger to health; and that the exemption should cover only specific cases and not an entire industry, and for specific periods limited in time."

Receiver Named.—Creditors of the Western Implement & Motor Co., Davenport, Ia., have secured the appointment of a receiver through bankruptcy proceedings before Judge Smith McPherson, of the federal court. Liabilities are said to be $100,000 with assets of $50,000. It is said $275,000 worth of preferred stock has been issued the past year and $1,000,000 worth of common stock given as bonuses. Tractor engines and cotton pickers were made.

Blast Furnace Project at New York

Arouses Much Interest—Merchants' Association Compiles Statistics of Consumption of Pig Iron

Much interest has been aroused in iron and steel and metropolitan business circles generally by the exclusive announcement in THE IRON TRADE REVIEW in last week's issue of options having been taken upon a large site along the Jersey shore and of definite plans being matured for the erection of two blast furnaces in New York harbor by Witherbee, Sherman & Co., and associated interests. It has been generally appreciated in all circles where the announcement has been carefully read and considered that the project is one of more than usual importance in its bearing upon future iron and steel development in the eastern district.

It has been known for some time that various interests, some of them more or less remotely connected with the iron and steel trade, have been seriously considering New York harbor as a site for blast furnaces. Rumors of this kind have been in circulation in the metropolis for some weeks past and have cropped out in the metropolitan press, but they have contained no authoritative details. One of these rumors has connected the name of Nicholas N. Brady with a blast furnace project, but it can be said with authority that Mr. Brady has nothing to do with the plans being developed by the Witherbee-Sherman interests. Duncan, Young & Presser, 50 Church street, New York City, consulting engineers, are also reported by current gossip to be interested in a blast furnace proposition in New York harbor, but it is learned absolutely that these engineers have nothing to do with the Witherbee-Sherman plan. The engineers for this latter project are already prominently identified with the eastern iron and steel industry.

Consumption of Pig Iron

The Merchants' Association of New York, through its industrial development bureau, has been giving considerable attention to the possibilities of upbuilding an iron and steel manufacturing center, particularly the former, in New York harbor. This association has been compiling statistical information upon the extent of the consumption of pig iron in the territory adjacent to New York City as easily accessible by water. It recently sent out a letter to companies with pig iron melting capacity in the territory covered, asking them to furnish a statement of their average annual consumption. A summary of the result of this effort is as follows:

	Letters sent out.	Replies received.	Average annual consumption of pig iron, tons.
Alabama	5	1	120
Connecticut	36	19	52,456
Delaware	8	5	23,084
D. of C.	6	1	215
Florida	7	3	1,385
Georgia	7	2	300
Louisiana	15	1	480
Maine	8	5	2,810
Maryland	29	11	18,746
Massachusetts	62	28	57,016
New Jersey	82	42	83,554
New York	105	52	99,782
North Carolina	6	3	193
Pennsylvania	59	20	73,421
Rhode Island	12	6	18,141
South Carolina	6		.....
Texas	7	2	987
Virginia	27	10	14,661
Total	487	211	447,351

It is believed that this total of consumption does not represent more than one-half of the iron annually melted in those districts accessible to New York harbor.

Following the public announcement of the Witherbee-Sherman plan in THE IRON TRADE REVIEW, the Merchants' Association gave out a statement commenting upon the importance of the project to the metropolis. This says in part:

"New York City is about to enter upon a new and important field of industry, which will involve the investment of millions of dollars and will demand a large additional supply of labor. This is the pig iron industry. At least three different and distinct projects are now on foot, looking to the establishment of blast furnaces on New York harbor.

"These definite plans for the erection of blast furnaces within New York City's industrial district are striking evidence of the truth of the statement that New York City and its immediate vicinity offer an exceptionally favorable location for pig iron production. In fact, the Industrial Bureau of the Merchants' Association believes there is no doubt that a location on New York harbor is better adapted to the manufacture of pig iron than almost any other section in the United States.

"The prime factors in the total production cost of pig iron and other iron and steel products are the raw materials, and transportation costs in assembling the raw materials are the significant item in determining the total material cost. The average cost of the materials in pig iron production is over 80 per cent of the total production cost and costs of assembling the raw material average nearly one-third of the total production cost. Equally important are the transportation costs required for placing the finished product in the market.

"With the opening of the state barge canal, New York will have the strategic advantage of low transportation costs for receiving the raw materials. The New York producer will not be dependent upon Lake Superior ore, for with the enlargement of the Lake Champlain canal New York will have direct access to the rich ore deposits of the Champlain district. This means that the New York producer will secure his ore at a lower cost than ore can be secured in any other section of the United States with the exception of Birmingham, Ala. The Birmingham producer, however, faces high transportation costs in reaching a market for his products, while the New York location furnishes a market in its immediate vicinity.

"Not only will the New York producer have cheap ore, but the New York location will furnish excellent fuel at a low cost. New York has a low rate on coal and the erection of a by-product coke plant means a plentiful supply of relatively cheap coke. Careful estimates of the relative costs of both beehive and by-product coke laid down at the furnaces in the various pig iron producing districts show that the New York location will have a great advantage in fuel costs over some districts and will be placed at no disadvantage as compared with any.

"The reduction of the tariff has had as a matter of fact very little effect on the development of pig iron production in New York City. The plans of the companies which are seeking a New York location were well under way before the tariff was revised. The entire development is based on the fundamental advantage which New York City possesses and which will be considerably enhanced by the new improvements which are approaching completion.

"Cheap pig iron production is the prime factor in cheap steel production. The export of iron and steel manufactures is the significant feature of our export trade. Since a New York location means a low cost, it is not too much to believe that eventually there must be a centering of steel works and rolling mills in this vicinity."

Catalogs Requested.—The file of catalogs of the Cleveland Furnace Co., Cleveland, having been destroyed by the flood of last spring, the company would be pleased to receive catalogs of mill supplies, steam specialties, etc.

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The Saloon and the Foundry

An important subject discussed at the Chicago meeting of the American Foundrymen's Association and allied organizations last week was how to prevent the location of saloons in the immediate proximity of industrial plants, particularly foundries, and how to get rid of those saloons already established. The problem, which is considered closely to the "safety first" movement, was referred to a committee, which will give it careful consideration.

The habit of drinking beer and other intoxicants during working hours and at lunch time has long been a curse to the foundry trade, and although some changes for the better have taken place in recent years, it is still indulged in to a deplorable extent. The feature of the evil which is now receiving special attention is the visiting of neighborhood saloons by molders during working hours. When saloons are located within a few feet of a foundry, it is possible for the workingmen to slip out from time to time, fill up on beer, and return to work in a short time. Of course, brains are muddled. The result is not only poor work, but frequently serious accidents. In one case which has been brought to our attention, a man who had absented himself and visited a saloon for a few minutes returned to work at an emery wheel, and through his carelessness the wheel burst and a large piece forced back the guard and struck the man on the head, causing injuries which sent him to the hospital for many weeks. Under the employes' compensation acts of many states, an employer would probably be held responsible in a case of this kind, largely because it would be difficult to prove that the employe was in a state of intoxication and for that reason was responsible for the accident.

"Back with the saloon" was the slogan suggested in connection with the meeting in Chicago. Practical methods of bringing about the greatly desired changes will be considered at an early date. In some states, where the laws permit, appeal will be made to the license commissioners and others in authority, while in other states different methods of preventing and abolishing the nuisance of the nearby saloon will be adopted. The movement is worthy of the careful thought of all connected with the foundry trade and manufacturers in general and deserves the hearty support of all who wish to see the condition of the workingmen improved.

Impressive Figures

The Daily Iron Trade points out some fundamental facts, which are not given due consideration by all observers nowadays. Our contemporary shows that pig iron production for September was at the rate of 30,000,000 tons a year, a greater tonnage than was ever produced by the country in a calendar year; that Connellsville coke is being produced at a rate which clearly indicates that the output for 1913 will pass the 20,000,000 total of last year; that the number of idle cars on Oct. 1 decreased to only 10,374, a reduction of 29,785 cars in two weeks; and, finally, that the movement of iron ore this year indicates shipments of fully 50,000,000 tons from the Lake Superior region.

All of these figures clearly show that in spite of the pessimistic talk which is so fashionable, the country is producing and consuming at a rate which only a few years ago would have been considered marvelous. Against such solid facts can be put little but gloomy forebodings.

It is time to cheer up. With everybody talking and feeling better, business will be better.

The Foundrymen at Chicago

The recent convention of the American Foundrymen's Association, the American Institute of Metals and the Associated Foundry Foremen at Chicago, was undoubtedly one of the most impressive gatherings of practical and scientific men ever held in the west. The combined registration totaled 797.

Two features stand out prominently from the mass of impressions gathered by a convention visitor. One is the growing willingness on the part of foundrymen of all classes to co-operate without limit in the interchange of information for the benefit of the trade; the other is the steadily increasing importance and value of the scientific work of the American Foundrymen's Association and the American Institute of Metals.

Foundrymen are facing great technical problems, which will require united effort for their proper solu-

tion. One of the most important of these is the question of cost keeping. Probably more money is lost every year by the casting manufacturers through a lack of accurate cost data than in any other industry of similar magnitude. The Allied Associations will give this subject special attention during the coming year in order that a suitable standard foundry cost keeping system may be prepared for presentation at the next convention.

Judging from the annual reports of President Miles and Dr. Moldenke, the iron founders do not expect any great industrial disturbance through the operation of the new tariff law, nor do they think that the American business men will be unable to cope with the situation in a satisfactory manner.

No Cause for Worry

It has been generally known in the iron trade of this country that there are large iron ore deposits in Brazil. Different explorations made in that country in recent years have brought what apparently is a vast body and good mineral quality to the attention of men of large affairs in the iron and steel industry of the United States. It remained for an expert testifying recently at the trial of the United States Steel Corporation to publicly fix the probable extent of these deposits at the estimated figures of 4,000,000,000 to 8,000,000,000 tons.

A few years ago the possibility of an ultimate scarcity of ore properly located commercially to serve the iron and steel industry adjacent to the Atlantic coast gained no little recognition. The very mention of such an eventuality today only brings a smile from the eastern furnacemen. In the words of one of them, no longer can the specter of such a famine impress them.

The recent maturing of plans for the revival of inauguration of development work upon large ore deposits in Venezuela, in Chile, in Texas and other localities accessible by water transportation to the eastern seaboard promises to strengthen the potential reserves of that section. Furthermore, the steady development of Cuban, Newfoundland and local properties in the east affords a constantly broadening and dependable source of supply. Such deposits as those of Brazil, not devoted to commercial purposes, suggest the possibilities for a continued extension of future supply when the demand shall make their utilization necessary. The existence and location of such a vast mineral body add weight to the conviction that the east, when it needs it, can obtain all the ore it will require indefinitely and will be able to get it undoubtedly within a proper scope of costs.

Give the Railroads Fair Treatment

The 5 per cent increase in freight rates in territory east of the Mississippi and north of the Ohio and Potomac rivers provided for in the revised tariffs filed with the Interstate Commerce Commission is of very great importance to the railroads and to the people of the country. President Daniel Willard, of the Baltimore & Ohio, has pointed out that it is a matter of public record that in no country in the world do the people make use of so much transportation per capita as in the United States, due, of course, to the great area of the country, and to the fact that our domestic economy has been built up upon the theory that each part of the country should be made to raise the crops and develop the products most in keeping with its natural resources, and then depend upon the transportation facilities to move the crops, the coal and the ore from the place where each can be most economically produced to the place required by the ultimate consumer. For these reasons, the rate per ton mile is important, and so is the keeping of the railroads in first-class condition. We trust and believe that the Commission will investigate the subject in a broad-minded spirit and allow the new rates to stand, if the investigation shows that they are just.

The time when it was the fashion to oppose everything that the railroads asked seems to be passing. This is shown, for example, by the recent act of the Public Service Commission of Massachusetts in approving the proposal of the New Haven railway to issue bonds to fund its floating debt and to provide for further improvements. If this permission had not been granted, the road would have been compelled to find $67,000,000 in the market—a rather difficult thing to do at the present time. The company is now offering its bonds for sale and the outlook is that it will start upon a new era of good management and progress. In thus meeting the railroads fairly and squarely, incalculable good can be done to them and to the people.

Attorney General McReynolds' Views on Trusts and Business

(From an interview with James B. Morrow, newspaper correspondent, published by the *Cleveland Plain Dealer.*)

"I am opposed to a strict regulation of business, and likewise to the ownership of business by the government. Therefore, I am trying to help bring about free-working conditions, or competition in business. I am not hostile to wealth, nor to men who are doing business openly and fairly. Neither do I enthrone those men who have gained great wealth by unjust practices. I thus state my position in a few words. I want to see prices natural and not unnatural—to see them fixed by the laws of trade and not by combination among producers."

BRITISH IRON TRADE

Continues to Drop—Strike Settlements Bring No Relief.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Oct. 11.

The week has been a bad one for the iron trade, and it is now clear that the unsatisfactory position is due to causes much more far-reaching than labor unrest. The big strikes directly affecting the iron and steel trades have come to an end without these trades deriving the least benefit. In the pig iron business, prices have fallen lower than since June, in spite of a slight decrease in warrant stock and moderately good shipments. There is a little sentimental improvement, due to tariff relief in America, but this has been more than counterbalanced by German and Belgian competition in continental markets. The few sales reported have been restricted to small odd lots for prompt requirement.

While buyers are holding aloof, a similar attitude is being taken by makers who look for better returns before cultivating long contracts. The damping down of furnaces has so far not afforded any benefit. It is said a cargo of pig iron to be sent out as an experiment to America has been fixed up, but the general belief coincides with the American opinion conveyed in THE IRON TRADE REVIEW cable received at the Birmingham office this week, that, with present freights, there is little hope of large or profitable business with America. Yesterday's quotations at Cleveland were 53s 1d ($12.90), with 53s 2d ($12.92) one month, and 53s 7d ($13.02) three months.

The feature of the quarterly meeting in Birmingham on Thursday was a very large attendance of foreign competitors, especially from Belgium and Germany. There has been nothing like this for years. A leading member of the Belgian Steel Syndicate was among the visitors, and it was clear that the foreigners were out for business. He frankly stated as much in conversation with the English representative of THE IRON TRADE REVIEW. The following are some of the quotations they offered. Sheet bars, £4 17s 6d ($28.88); ordinary 2-inch billets, £4 12s 6d ($22.64); iron bars ⅝-inch finished, £5 15s ($28.16); steel bars, £5 10s ($26.94). The present quotation for British billets is £5 ($24.48) for Bessemer and £5 2s 6d ($25.10) for Siemens.

British makers are apparently not worrying much about foreign competition, but a good deal of business in raw steel was taken back from Birmingham to the continent. The iron trade was weak in all directions. The attendance of Welshmen at the quarterly meeting was exceptionally small. This was not because work is not badly wanted for there are scores of mills idle, but because production at the present time involves the mills in actual loss. The tin plate makers are really compelled to keep their mills idle, pending better times. Prices still tend downward, in spite of the substantial reduction made in the first half of the year. In the galvanized sheet trade, the Welsh mills continue fairly busy, but they leave only a few crumbs for the mills in the Midlands, where the inland position and much older plant constitute a severe handicap for all foreign trade.

Death of Wm. A. Johnson

William A. Johnson, general sales agent of the Jamison Coal & Coke Co., Pittsburgh, died Oct. 16 at his home in that city from pneumonia. Death came as a surprise to his many friends, as he had been enjoying apparently good health until less than a week before his demise. Mr. Johnson was well known in all branches of the iron and steel trade. After several years' experience as traveling passenger agent for the Southern railway, he accepted a position in the offices of Rogers, Brown & Co. at New York, and became private secretary to the late Archer Brown a short time later. Mr. Johnson was especially interested in the operations of the coke department and soon became head of that branch for the company at Chicago. In 1904 he took charge of the coke department for the Rogers-Brown interest at Pittsburgh. On Aug. 1, 1905, he accepted a position as general sales agent for the Jamison Coal & Coke Co. Mr. Johnson was born in North Carolina 39 years ago. His widow and four children survive.

Iron and Steel Statistics.—A report on the production of iron ore, pig iron and steel, by Ernest F. Burchard, of the United States Geological Survey, has been issued as an advance chapter from Mineral Resources for 1912 and can be had on application to the director of the survey. The report includes statistics of production showing a highly prosperous condition in the iron and steel industries for the year, the total output of iron ore being valued at $107,050,153, an increase of $20,000,000 over 1911. The report also contains brief accounts of the iron-ore resources of California, Montana, Arkansas and the adjoining portions of Tennessee, Alabama and Georgia.

Red Iron Ores of the South

A preliminary report by Ernest F. Burchard, of the United States Geological Survey, has been issued as an advance chapter from Bulletin 540, "Contributions to Economic Geology, 1912". Much geologic work bearing upon the utilization of the iron ores of the southern Appalachians has been and is being done by the Alabama, Georgia and Tennessee geological surveys as well as by the Federal Geological Survey. The area discussed in the present report includes what is known as the Chattanooga district, and the greater part of the expense of the field work was borne by the United States Geological Survey, the Tennessee Geological Survey and the Chattanooga Chamber of Commerce.

The city of Chattanooga lies within four miles of the southern boundary of Tennessee, and as there are more important reserves of red iron ore within 30 to 40 miles south of the city than within an equal distance to the north it was the desire of the Chattanooga Chamber of Commerce that part of the funds allotted for prospecting should be used in Alabama and Georgia, in order to demonstrate the value of the ores tributary to the city. The prospecting was accordingly done without reference to state boundaries.

The report (Bulletin 540-G) covers 54 pages and is illustrated with sketch maps. It will doubtless prove of much interest and value in the economical development of the iron ores of the district. A copy may be obtained by any interested person on application to the director of the United States Geological Survey, Washington, D. C.

Shipbuilders are beginning to line up a little new tonnage. J. C. Wallace, president of the American Ship Building Co., closed contract in Pittsburgh last week for a bulk freighter to be a duplicate of the Quincy A. Shaw, of the Hanna fleet. She will therefore be 524 feet over all, 504 feet keel, 54 feet beam and 30 feet deep, and will be built on the Isherwood system of construction.

Lowell H. Brown, formerly assistant to the president of the Empire Steel & Iron Co., now is president of P. J. Moranti, Inc., 2 Wall street, New York City, contractor and engineer.

Mining Engineers Discuss Iron and Steel Topics

Furnace Practice, Fuels, Over Oxidation, Critical Temperatures and Other Subjects Discussed—More Money Needed by Bureau of Standards

With more than 200 leading metallurgists and engineers in attendance, the American Institute of Mining Engineers held its 106th meeting on Oct. 16 and 17, at the Engineering Societies' building, 29 West Thirty-ninth street, New York City. The meeting was held under the auspices of the iron and steel committee, and those present, in addition to the members of the institute, included representatives of the following bodies: American Society for Testing Materials; American Society of Mechanical Engineers; American Iron and Steel Institute; American Society of Civil Engineers; American Institute of Electrical Engineers and the American Foundrymen's Association.

Charles F. Rand, president of the institute, called the meeting to order Thursday morning, making a short address of welcome, and congratulating the iron and steel committee on the important work it has accomplished since the time of its organization, and on the many valuable papers which it has caused to be added to the proceedings of the institute. In this connection, he mentioned particularly the efforts of Dr. Albert Sauveur, Herbert M. Boylston, Bradley Stoughton and Henry M. Howe, as members of that committee.

The meeting was remarkable for the large amount of business which was transacted during the short time it was in session. Four sessions, for the presentation and discussion of papers, were held during the two days. Altogether 24 papers were read and all but a few of them were productive of lengthy discussions. In order that no part of the original program should fail of being carried out through lack of time, 15 minutes for the reading of papers and five minutes for discussion were allowed each individual.

Owing to the illness of Charles Kirchhoff, chairman of the iron and steel committee, Dr. Sauveur, vice chairman, directed the proceedings during the first and third sessions. The second session was presided over by Joseph W. Richards, professor of metallurgy at Lehigh university, and the fourth by Rossiter W. Raymond, secretary emeritus of the institute. In the absence of President Rand, Mr. Raymond also dismissed the meeting on Friday afternoon.

A feature of the meeting was the paper on "Over-Oxidation of Steel", contributed by W. R. Shimer and F. O. Kichline, and read in their absence by E. O'C. Acker, metallurgist of the Bethlehem Steel Co. It described investigations conducted for the purpose of studying the extent of over-oxidation of steel that can be accomplished by excessive over-blowing in a Bessemer converter. During the tests, every effort at over-oxidation was made, both by over-blowing and by ore addition. Among the conclusions reached was the judgment of the experimenters that, under the usual conditions of practice, with the addition of recarburizers, a steel of over 0.03 per cent oxygen will hardly result, and that the highest obtainable under any conditions, without recarburizing, is not likely to be over 0.075 per cent. Anything higher must come from drillings improperly taken or from oxidation that occurred during teeming.

Capt. Hunt's Resolution

Recognizing that the work being accomplished by the United States Bureau of Standards is of great value, not only to the scientific but also to the commercial interests of our country, the persons present at this meeting of the American Institute of Mining Engineers, held in New York this 17th day of October, under the auspices of the iron and steel committee of said institute, most earnestly urge upon the proper national governmental committees and authorities the supreme importance of proper financial and other support to that bureau, and also request that allied and kindred American scientific and commercial organizations also act in this matter in such ways as in their judgment seem best advised.

This paper brought out some interesting remarks. J. E. Johnson Jr. said that the question of over-oxidation of steel is one of temperature more than of chemistry. If the temperature is high enough, he said, the carbon will react properly with the oxygen, but if the temperature is low, this reaction will not be complete. Dr. A. S. Cushman endorsed Mr. Johnson's remarks and said that the higher the carbon content of the bath, the less danger there is of over-oxidation. Prof. Henry M. Howe said that the old belief that metal once over-oxidized could not be restored satisfactorily seems to be disproved by the results obtained at electric furnace plants.

John H. Hall's paper on "Shock Tests of Cast Steel" described the practical working of the Fremont test for measuring the energy consumed in breaking a bar of steel ⅜ by ¼ by 1¼ inches, notched with a hack saw to cause the break to occur at a fixed point. A falling weight, with chisel edge, causes fracture of the piece from impact. The residual force in the weight, after it has broken the specimen, is recorded by an ingenious device, and the difference between this and the total energy is the force consumed in breaking the specimen. The value of the test is in detecting brittleness not revealed by tensile or slow-bending tests, particularly as revealing the effect of heat treatment.

In commenting on this paper, Prof. Howe was of the opinion that the impact test is not needed, except to distinguish fine from coarse material. The impact test is also more valuable in locating flaws in the steel. For all ordinary purposes, however, he said, the tensile test can be employed to better advantage than the impact test. The results obtained by the two tests, although in different units, are strictly proportioned. W. C. Chancellor upheld the use of the shock test as opposed to the tensile test when testing steel castings. William R. Webster also favored the shock test, saying that the tensile test does not always give the results desired. Prof. Campbell, of Columbia university, told about some tests he recently conducted, in which steel which sustained heavy tension, broke "like sugar" when subjected to the shock test. He was therefore of the opinion that the impact test gave more reliable results than the tensile test. Dr. Waldo described an extremely sensitive and accurate impact testing machine which he has used.

A paper on "Fine Ore Briquettes", by E. Stuetz, and another by R. H. Lee, on "The Use of Nodulized Ore in the Blast Furnace", aroused much interest on the part of those present. This intensified as the result of a carefully prepared discussion of both subjects contributed by J. E. Johnson Jr. All three will be summarized in a later issue.

The paper by W. A. Forbes, on "Blast Furnace Gas Cleaning", called forth much discussion. S. K. Varnes, of the Pennsylvania Steel Co., told about his experience in gas washing, which led him to believe that it is sometimes more advantageous to use unwashed than washed gas. At the Steelton furnaces, he said, the scrubbing towers were given a thorough

trial, with the result that the washing of the gas was finally discontinued. At the present time, the Pennsylvania Steel Co. washes only the gas to be used for operating gas engines. A. N. Diehl, of the Carnegie Steel Co., Duquesne, Pa., described the washing plant at Duquesne. This consists of nine scrubbers, that wash about 100,000 cubic feet of gas per minute. The operation of this system, he said, has been attended by very satisfactory results. The secretary of the institute closed the discussion by reading communications from three German and one English manufacturers of gas washing apparatus. These contained descriptions of installations made by their concerns.

David S. Jacobus, advisory engineer of the Babcock & Wilcox Co., took a leading part in the discussion of Mr. Stone's paper on "The Generation of Steam by Waste Heat from Regenerative Furnaces". He said engineers are just awakening to the possibilities of using waste heat under boilers, and he told about recent investigations made by the Babcock & Wilcox Co. Mr. Jacobus emphasized the importance of providing the proper draft resistance where boilers are to be operated on waste heat; as the draft resistance is increased, the heat in the gas is reduced. He said it is advisable to use an economizer in some cases, but that this was a debatable question and that each case must be considered individually. Dr. Jos. W. Richards also spoke in favor of replacing dependence on the chimney by means of forced draft. The chimney, he said, absorbs too much heat and thus lowers the efficiency of the plant.

T. T. Read, New York editor of the *Mining and Scientific Press,* gave valuable data on the performance of various types of boilers operated with waste heat; and a paper on "The Generation of Steam by Waste Heat from Regenerative Furnaces" was presented by G. C. Stone.

Grain Growth of Silicon Steel

A paper on "Grain Growth in Silicon Steel", read by W. E. Ruder, was of interest to many because of the extensive use of silicon steel now made in the manufacture of power transformers and other electrical apparatus. In reply to a question asked by Dr. Cushman, the author stated that his observations have shown that the watt loss is not affected by the size of the grains. The hysteresis loss, he said, corresponds with the size of the grains.

A resolution asking governmental aid for the United States bureau of standards was introduced by Capt. Robert W. Hunt, past president of the institute and approved by the members present at the meeting. Capt. Hunt told about many vain efforts which he has made from time to time to stimulate the work of the government in conducting metallurgical and other scientific research work.

"It is surprising and disappointing," said he, "to note the lack of enthusiasm and intelligent understanding with which our law-makers look upon this important subject. If they could see the necessity of spending money for this cause as clearly as they see the need for making appropriations for battleships and post offices, much lasting good would result to the people of the nation."

The work of the bureau of standards, as described in a paper read by Dr. G. K. Burgess, of Washington, evoked the earnest congratulations of the members. Dr. Burgess told of investigations which the bureau has conducted to locate "A-2" and "A-3", the second and third thermal points in pure iron; and also to ascertain the nature of the transformations which occur at these two points. The results of the bureau's experiments, said Dr. Burgess, show that under standard conditions there is a definite transformation at 768 degrees, and a less well defined, although more intense transformation, at 898 to 909 degrees, in terms of their maxima on cooling and heating. Whether there is any so-called "Beta" iron in the region between "A-2" and "A-3", however, simply depends upon the definition of allotropy. Dr. Sauveur commented as follows on Dr. Burgess' report:

"The subject of the existence of 'Beta' iron, which was declared dead at the May meeting of the Iron and Steel Institute, is now alive as a result of the work of Dr. Burgess and his associates. This, I believe, is the most important work now being done in the science of metallurgy."

Dr. Burgess stated that the bureau in the future will conduct similar investigations on masses of iron, in order to determine whether the same results occur with large bodies of iron as with small ones. Thus the scope of the experiments will be extended to iron as used for practical purposes.

Other papers presented were, "The Slagging Producer", by W. H. Blauvelt; "The Use of Powdered Coal as Fuel", by W. S. Quigley, H. R. Barnhurst and Richard K. Meade; "A Chart for Psychrometric Determinations", by C. P. Linville; "The Future of the Chilled Car Wheel", by P. H. Griffin; "Position of A-3 in Carbon Iron Alloys", by H. M. Howe and A. G. Levy; "Equilibrium Temperature for Al in Carbon Steel", by H. M. Howe; "Influence of Various Elements on Absorption of Carbon by Steel", by R. R. Abbott'; "Influence of Copper Upon the Physical Properties of Steel", by G. H. Clevenger and B. Ray; "Life of Crucible Steel Furnaces", by J. H. Hall, and "Regenerators for Open-Hearth Furnaces", by H. F. Miller Jr.

Three of the papers scheduled for this meeting were not read, namely, "Briquetting", by Felix A. Vogel; "The Divorcing of the Eutectoid in Meteorites", by Prof. Henry M. Howe, and "Some Phases of the Practical Treatment of Tool Steel", by J. V. Emmons. These will be presented at the February meeting.

On Friday night the members of the institute held a dinner at the Engineers' Club, followed by an informal entertainment. This was the only diversion provided by the program.

Cuban Ore Production

Consul R. E. Holaday, of the consular district of eastern Cuba, reports that the output of the iron mines in that district last year was greater than ever before in the history of the industry. There were exported from Felton, on the north coast, 477,053 tons, worth $842,881, and from Santiago and Daiquiri, on the south coast, 952,700 tons, valued at $2,827,272.

The following table shows the number of tons and value of iron ore shipped to the United States from this consular district the past five years:

Years.	—Iron ore— Tons.	Value.
1908	570,310	$1,726,698
1909	960,880	2,945,065
1910	1,223,066	4 298,661
1911	1,145,135	3,184,088
1912	1,429,753	3,872,078

Barney & Smith Dividend

A dividend of 25 per cent in favor of the holders of unsecured claims and accounts against the Barney & Smith Car Co., Dayton, O., which went into the hands of a receiver several months ago, was recently ordered by Judge E. T. Snediker, of the common pleas court of Dayton, upon the application of the receivers, H. M. Estabrook and Charles L. Harrison. The 25 per cent dividend amounts to $468,000. The receivers gave a brief summary of the company's financial situation at the present time, as follows: Cash on deposit, it is stated, totals $744,715.81 and good receivable accounts amount to $527,592.09. The company has orders on its books amounting to $4,701,505.57, enough to keep the plant in operation until next April. The total amount of claims or accounts of unsecured and general creditors of the company is $1,870,178.19, a portion of which has not been fully adjusted.

High Cost of Pig Iron Making by Tennessee Co.

Testified in Steel Corporation Suit—John Birkinbine Not Alarmed by Prospect of Exhaustion of Ore—Number of Witnesses Tell About Competition

The Steel Corporation hearings last week were devoted mainly to the taking of testimony to refute the allegation of the government that the Corporation controls a monopoly of the iron ore reserves of this country. In this connection, John Birkinbine, well-known Philadelphia engineer, testified that it would be impossible for any company to secure such a monopoly, and that the iron and steel industry in this country is in no danger of restriction through lack of ore. With the ore reserves now known to exist in this country, he said, it would be possible to form a new steel company having blast furnaces in five states, consuming annually 1,500,000 tons of ore.

Charles Catlett, consulting engineer, Staunton, Va., testified that the blast furnace costs of the Tennessee Coal, Iron & Railroad Co., in 1907 were higher than those of any other southern furnace company at that time. In 1896, he said, Andrew Carnegie, when told that he might find it profitable to purchase the Tennessee company, contemptuously referred to the latter company as a "football proposition".

A number of the Steel Corporation's customers were called to the stand to testify regarding conditions of competition. Mr. Catlett, told about an investigation of the Tennessee plant, which he made in November, 1907, in accordance with instruction he received from James Gayley, then vice president of the Corporation.

Coke Use was Lavish

In September, 1907, the Tennessee company, in producing pig iron, used on an average, 3,812 pounds of coke to one ton of pig iron. Of the various furnaces, No. 2 consumed 5,006 pounds of coke to one ton of pig iron; No. 4, 4,494 pounds of coke to one ton of pig iron, and No. 6, 3,470 pounds of coke to one ton of pig iron. Thus, for the month of September, 1907, it cost the Tennessee company $11.88 to produce a ton of iron. This cost, said Mr. Catlett, was, as far as he knew, higher than that for any other southern furnace. The average coke consumption in the south at that time, when red ore only was used, was 3,300 pounds for each ton of pig iron, said Mr. Catlett. And when brown ore was used along with the red, as was the practice of the Tennessee company, the average consumption was 3,000 pounds per each ton of iron, the amount of coke decreasing as the amount of brown ore in the mixture was increased. Thus the Tennessee company was in a disadvantageous position in the south as to the production cost of pig iron.

Advised Buying All Plants

Mr. Catlett, in telling about his report to Mr. Gayley, following his visit to the Tennessee plant in 1907, testified that he advised the Corporation to purchase, in addition to the Tennessee company's property, the plants of all the other steel and iron companies of importance in the south. These were the Birmingham Coal & Iron Co., now owned by the Woodward Iron Co., the Sloss-Sheffield Steel & Iron Co., the Alabama iron holdings of the Woodward Iron Co. and the Republic Iron & Steel Co.

"And was your suggestion acted on by the Steel Corporation?" asked David A. Reed, of counsel for the defense.

"No," said Mr. Catlett, "I was astonished that not the slightest interest was shown in my suggestion."

Tennessee Company a Football

Andrew Carnegie, in 1896, called the Tennessee Coal, Iron & Railroad Co. a "football proposition", said Mr. Catlett during his cross-examination by the government. Mr. Catlett said, in 1896, he was carrying on some negotiations with Mr. Carnegie for some southern iron ore properties. The iron-master seemed to be interested, and Mr. Catlett suggested to him that he consider the proposition of buying the Tennessee Coal, Iron & Railroad Co., which had been represented to be a large and valuable property.

Mr. Carnegie replied that he would "have nothing to do with that football proposition".

Mr. Catlett stated that in the course of his work in the south he had examined 3,200 acres of land, only a portion of which was ore-bearing.

Mr. Birkinbine's Testimony

John Birkinbine, Philadelphia, engineer, who was called to the stand Thursday, gave his opinion that the development of the iron and steel industry of the country is in no danger of being restricted by a scarcity of suitable ore. In response to a hypothetical question from Mr. Reed, he stated that there would be no trouble to muster sufficient ore resources for the organization of a new steel company with blast furnaces located in Illinois, Indiana, Ohio, Pennsylvania or New York and consuming 1,500,000 tons of ore annually. Mr. Birkinbine qualified as an expert on iron ore by testifying that he had examined deposits in 25 states of the United States, in addition to some in Canada and Mexico, and had served the government in compiling various publications regarding the iron ore resources of the country.

No Monopoly Possible

Mr. Birkinbine declared no absolute monopoly of the iron ore of the country by any steel company was possible; he was equally emphatic that no practical monopoly of the iron ore resources of the country could be obtained. Speaking of the historic Cornwall mines in central Pennsylvania, the witness stated these had been producing ore magnetite since 1740, and their output today was about 500,000 tons annually, with every prospect of continued life. Mr. Birkinbine said the indications of exhaustion of this property are less marked than 20 years ago.

Octavus N. Hutchinson, president of the Grand Crossing Tack Co., Chicago, testifying on Friday, told of active competition which his company has generally experienced both as a seller of wire products and as a buyer of pig iron. Mr. Hutchinson said there was in reality a very active competition in wire products, and that prices varied constantly. He said that it depended upon the prevailing conditions whether a manufacturer could obtain the quotations in the trade papers for his wire products. On a rising market, business was usually taken at these prices; if a reverse market prevailed, "we had to get what we could get," said the witness. Mr. Hutchinson stated that his company manufactures barbed wire, woven wire fence and rivets, tacks and staples. It sells about 52,000 tons annually, including some billets. Its sales of nails reach about 325,000 kegs yearly. The company buys about 20,000 tons of pig iron a year. A small portion of this at times has been furnished by the Illinois Steel Co.; a larger portion, about 15 per cent, by the Tennessee Coal, Iron

& Railroad Co., and the rest by various independent makers.

Warren S. Hallett, superintendent of supplies and purchasing agent of the Postal Telegraph & Cable Co., testified that his company purchased about 5,000 tons of telegraph wire and from 1,000,000 to 1,250,000 feet of strand wire annually. He declared that there was a brisk competition among makers for the orders he had to place and that prices varied generally so that different makers at times receive the bulk of the contracts.

F. W. Wurster, of F. W. Wurster & Co., Brooklyn, who is an ex-mayor of that city, and is now a manufacturer of iron bars and axles, told of his observations of competition from the standpoint of a buyer of steel products. His company is a buyer of axle billets. Up to about ten years ago, Mr. Wurster said, the Carnegie Steel Co. usually had his business. Since then it has gone entirely to the Jones & Laughlin Steel Co. He stated that it has been his observation that the Carnegie Steel Co. more uniformly maintained its prices than its competitors among the independent companies. The independent steel makers, he said, were usually higher in price on a good market and were among the first to make concessions when trade was unfavorable.

Maximilian Lewinson, a consulting and structural engineer, of 44 West Seventy-seventh street, New York, stated that he had competed against the American Bridge Co. on occasions for structural steel contracts. Sometimes, he said, he was successful in obtaining a contract in competition with the American Bridge Co., even where he had bought material from the latter company.

August Pahl, purchasing agent of Hammacher, Schlemmer & Co., New York City, hardware manufacturer, told that his company bought wire products and other steel materials at the best market. It has bought largely from the American Steel & Wire Co., but also regularly gives business to independent manufacturers. This division of its orders depends entirely upon the prices it receives.

Buyers Testify

Eight buyers of products manufactured by the various subsidiaries of the United States Steel Corporation, testified at the Steel hearings on Monday. They described conditions of competition in the trade and told about the treatment which they are accorded by the Steel Corporation subsidiaries and the competitors of the latter.

H. A. Keiner, of Keiner, Williams Co., Richmond Hill, S. I., said that during the past four or five years his concern has bought the bulk of its requirements from the American Sheet & Tin Plate Co., as that company has been best able to take care of the former's requirements. Questioned by Judge Dickinson regarding the products of his plant, Mr. Keiner said that his company manufactures soda water tanks, turning them out at about the rate of 8,000 a year.

Morton W. Reed, purchasing agent of the American Tobacco Co., told about contracts which he has placed for tin plate to be used in the manufacture of tobacco boxes and linings for boxes. The McKeesport Tin Plate Co., he said, obtained the contract for supplying the American Tobacco Co. in 1911. In 1912, the American Sheet & Tin Plate Co. took the contract, while the 1913 contract again was let to the McKeesport company. He said that in making purchases, he goes into the open market and buys at the best price obtainable.

Edward B. Peters, purchasing agent of the New Jersey Zinc Co., testified that he buys about 3,500 to 4,000 tons of fabricated steel and 1,000 tons of structural shapes annually. He also buys a large tonnage of sheets every year and a quantity of wire rope, wire nails, etc. On all of these products, he said, the prices are and have been variant and he places his contracts with whichever company will give him the best terms regarding delivery, price, etc.

Eugene E. Hinkle, president of the Hinkle Iron Works, New York, testified that he buys about $600,000 to $700,000 worth of structural material a year. Up to eight or ten years ago, he bought most of this from the Carnegie Steel Co., but since then, the largest part of his orders have gone to the Bethlehem Steel Co., as the latter company quotes him lower prices. In the past ten or twelve years, said Mr. Hinkle, there has been more variance in prices than prior to that. In cross-examination, he admitted that down to 1905, prices on structural material, with the exception of certain periods when the market was open, were practically uniform. The Carnegie and the Cambria steel companies, he said, have, in his opinion, maintained uniformly higher prices in recent years than the other steel companies.

Solomon O. Buschman, purchasing agent for Shalita Bros., New York, told about his purchases of tin plate, wire, etc. The only wire which he ever bought from the American Steel & Wire Co., he said was a sample lot of 1,000 bundles. The tin plate requirements of his company he buys from various concerns. In the products which the Shalita company purchases, said Mr. Buschman, there is a great deal of competition, and prices, as quoted by the different companies, vary. In making his purchase, he goes into the open market and places his contracts with whichever concern he can make the best terms, taking price, delivery, quantity and quality into consideration.

John Trounstine, New York, a partner in the Greenpoint Metallic Bed Co., testified that he buys for his company a considerable quantity of bars, rods, sheets and tubes, etc. In the sale of these products, he said, there has been active competition by their makers for the past ten years. During that time, he said, the prices as quoted by different concerns, have been variant.

Franklin L. Groff, of New York, testified that he is president of a number of metallic bed companies, operating plants in New York, Boston, etc. For these concerns, he directs all of the purchases, making contracts for mattress and spring wires, tubing, etc. In all of the products which he buys, there is active competition on the part of the manufacturers and in making his contracts, he goes into the open market and takes advantage of the best price he can get.

Henry H. Northrop, of Northrop, Coburn & Dodge Co., New York, said that his company buys a great deal of sheet steel annually for the manufacture of stamped steel ceilings. The percentage of this sheet steel furnished by the American Sheet & Tin Plate Co., he said, varies from year to year. At all times, he said, there is active competition in the market and the placing of contracts by his company simply is a question of the lowest price and the best terms.

National Founders' Convention

The seventeenth annual convention of the National Founders' Association will be held at the Hotel Astor, New York City, Wednesday and Thursday, Nov. 19 and 20. This year the iron molders' union has conducted an unusually aggressive campaign for the purpose of establishing the closed shop, and the association has been called upon to support more members on account of strike difficulties than in any year since 1906. The review of these strikes by the members affected will form a considerable part of the program. Labor legislation, ways and means for keeping the public properly informed on the labor problem, results of the workmen's compensation legislation that has been passed in different states and other subjects will be considered.

MEN OF THE IRON TRADE

ARTHUR V. DAVIS, president of the Aluminum Co. of America, Pittsburgh, sailed recently for a European trip.

C. C. WHITTIER was recently appointed treasurer and general manager of Robert W. Hunt & Co., Ltd., with headquarters in Montreal.

F. L. ZIMMERMAN was recently appointed Eastern representative of the Hoskins Mfg. Co., Detroit, with headquarters in New York City.

W. J. GREER, Empire building, Pittsburgh, is representing the American Fuel Saving Co., Cleveland, manufacturer of a line of furnace appliances.

T. W. COE was recently appointed superintendent of the New York Central shops at Elkhart, Ind., succeeding W. J. Fraunendiener, resigned.

RALPH H. SWEETZER, president of the Thomas Iron Co., Easton, Pa., has been elected president of the Ironton railroad, a subsidiary of the Thomas Iron Co.

JOHN M. STUDEBAKER, South Bend, Ind., last of the founders of the noted Studebaker Corporation, was recently presented a gold loving cup by employes of the company on his 80th birthday. He is enjoying excellent health, and still fills his position as chairman, reporting each morning at the factory at 7:00 A. M. and remaining until 6:00 P. M.

A. O. KRIEGER, formerly publicity manager of the Bush-Sulzer Bros. Diesel Engine Co., has taken charge of the gasoline engine sales of the Whitman Agricultural Co., St. Louis.

OTTO R. KIHM, formerly chief engineer with the Pratt & Cady Co., Hartford, Conn., was recently appointed mechanical assistant superintendent of the McNab & Harlin Mfg. Co., Paterson, N. J.

J. S. FRASER, superintendent of blast furnaces for the Carnegie Steel Co., Clairton Works, has resigned to take a similar position with the Pittsburgh Steel Co., Monessen plant, succeeding F. H. Gerwig, resigned.

EARNEST W. SAUNDERS, Cleveland sales manager of the Carbon Steel Co., Pittsburgh, was recently appointed district sales manager of that company for Ohio, Michigan and Indiana, with offices in the Ford building, Detroit.

W. L. KLUTTZ, general superintendent of the furnaces of the Republic Iron & Steel Co., Thomas, Ala., recently resigned to accept a position as vice president and general manager of the Central Iron & Coal Co., Tuscaloosa, Ala.

GEORGE S. GRISCOM JR., formerly connected with the iron trade in Chicago and Pittsburgh, is now representing the Riter-Conley Mfg. Co., the Cummings Structural Concrete Co., and the Wemlinger Steel Piling Co., with offices in London.

JOSEPH A. ANGLADA, consulting engineer, New York City, recently sold his interests in the Anglada Co., Detroit, and has resigned the presidency of that company to become interested in a company which will manufacture small cars of his design.

CURTIS A. MARSTON, formerly connected with the Blake & Knowles Steam Pump Works, East Cambridge, Mass., and later with the Minneapolis Steel & Machinery Works, recently accepted a position as efficiency engineer with the Chain Belt Co., Milwaukee.

A. E. BORIE has been made chairman of the board of directors of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J. He formerly was vice president of the company. L. W. Jones and W. L. Wright have been made vice presidents. Mr. Borie has also been elected chairman of the board of directors of the American Road Machinery Co.

TRADE NOTES

BUTLER, PA.—Equity proceedings have been instituted in the county court to have a receiver appointed for the Erie Coal & Coke Co., the mines of which are at Ferris, Butler county, Pa.

CHATTANOOGA, TENN.—The Converse Bridge Co. recently filed a voluntary petition in bankruptcy, giving its liabilities as $113,853, and assets as $185,735.

CINCINNATI.—The American Oil Pump & Tank Co., Cincinnati, advises that it has purchased the business of the American Tank & Pump Co., of Dayton, O., and that it is at present moving the plant to Cincinnati, after having recently incorporated from the latter city. The company will manufacture self-measuring and non-measuring oil pumps for handling gasoline, oils, paints, varnishes, etc., and also a line of storage tanks to be used in connection with these pumps. It is expected that the business will be established in Cincinnati within the near future.

CLEVELAND. — The Baxter-Frick Gear Cutting & Mfg. Co. is in the market for second hand bevel and spur gear patterns. A. K. Baxter, president.

FREMONT, O.—The Fremont Boiler Co. has secured the contract for repairing the boilers of the Union Tube Co., Elyria, O. The same concern has secured a large contract for the Ohio Light & Power Co., Tiffin, O.

GREEN BAY, WIS.—Greiling Bros. Co. has been awarded a contract for the construction and equipment complete, of eight steel pump scows for government work on the Great Lakes by the war department. Four will be delivered about Dec. 1.

LIMA, O.—A sturdy little 12-ton locomotive has been completed by the Lima Locomotive Co., for the board of control of the Louisiana state penitentiary.

LOUISVILLE.—It is reported that the Marathon Motor Works, Nashville, Tenn., will remove its plant from that city to Louisville.

MADISON, WIS.—The M. A. Hanna Dock Co., Cleveland, O., has amended its articles of incorporation to conform to its increased property value in Wisconsin. The original value of the Wisconsin holdings is $100,000 and the amendment states the value to be $336,716. The property consists of a large dock at Superior, Wis. The company is capitalized at $500,000.

MILWAUKEE.—The Allis-Chalmers Mfg. Co., through its Cleveland office, has booked a contract from the city of Akron, O., for the equipment of the municipal electric lighting plant to be constructed at a water power site near Kent, O. Among the requirements are one 300-horsepower and one 100-horsepower wheel, one 250 and one 75-kilo-volt-ampere generator and appurtenances.

MILWAUKEE.—The Allis-Chalmers Mfg. Co. has booked a contract from C. M. Walsh, Cuyahoga Falls, O., for the equipment of a hydro-electric plant, which will furnish power for the Walsh Milling Co. and Falls Rivet & Machine Co. The contract calls for two 250-horsepower water wheels, two 130-kilo-volt-ampere generators and appurtenances. The order was placed through the Cleveland office of Allis-Chalmers.

MILWAUKEE.—The Northwestern Malleable Iron Co., 766 Park street, has filed an amendment to its articles of incorporation increasing the capital stock from $150,000 to $500,000. It was stated at the offices of the company that the additional issue will be used principally to take care of the increased business no extensions or enlargements of any considerable size being contemplated at this time. When the company was organized the capital was placed at $150,000 and has remained at that figure ever since, although the volume of business has increased more than three-fold. Frederick L. Sivyer is president.

PITTSBURGH. — The Thomas Carlin's Sons Co. has received an order for a No. 3 shear from the United Steel Co., Canton, O.

PITTSBURGH.—Edgar M. Moore & Co., Farmers Bank building, have opened a warehouse, 916-18 Beham street, North Side, carrying a line of machine tools, mine and mill supplies.

PITTSBURGH. — The McClintic-Marshall Construction Co. has ordered a second 400 horsepower gas engine, direct connected to air compressor from the Snow Gas Engine Co., Buffalo, N. Y., with offices in the Oliver building, this city.

PORT WASHINGTON, WIS.—The Gilson Mfg. Co., manufacturing gasoline and gas engines for farm work, has filed an amendment to its articles of incorporation whereby the rate of dividends on preferred stock is increased from 6 to 7 per cent and dividends are payable semi-annually instead of annually.

SAN FRANCISCO.—The Moore & Scott Iron Works plans to remove its machine shop from Folson and Main streets to 678 Second street, and is preparing to install additional equipment.

SHARON, PA.—The American Steel Foundries is successfully operating a powdered coal installation under an open-hearth steel furnace. The National Malleable Casting Co. and the Sharon Steel Hoop Co. are among others in this city to adopt powdered coal in open-hearth practice.

TOLEDO, .—The Jos. L. Skeldon Co. recently secured the contract for two boilers of 100 horsepower each, for use in the Masonic Temple being erected in East Toledo. The boilers are to be of the Scotch marine type, internally fired.

NEW BUSINESS

ALABAMA

MOUNTAIN CREEK.—The Alabama Power Co., Birmingham, plans to erect a hydro-electric plant, plans for which are being prepared.

ARKANSAS

FORT SMITH.—The board of commissioners plans to build a dam across Poteau river for water supply. Estimated cost about $18,000.

HELENA.—L. R. Wright, Dallas, Texas, was recently awarded the contract for the new court house here, estimated to cost $229,999.

CALIFORNIA

LOS ANGELES.—The Mathie Brewing Co. plans to erect a three-story brick, steel and reinforced concrete building. John E. Kunst, architect.

LOS ANGELES.—The Maier Brewing Co. plans to erect a brick, stone, iron and concrete addition estimated to cost about $100,000. Richard Griesserm, Schiller building, Chicago, architect.

RICHMOND.—The Pacific States Telephone & Telegraph Co. plans to erect a three-story fireproof exchange building here, estimated to cost $100,000, a site for which is now being sought.

SAN DIEGO. — The Davis-Leavitt Co., agents for the Kissell and Overland automobiles, plans to erect an 82 x 140 foot machine shop, contracts for which will be awarded soon.

SAN FRANCISCO.—A. Eisenberg plans to erect a six-story hotel, estimated to cost about $65,000.

SAN FRANCISCO. — The Cheny Estate plans to erect a 14-story steel and brick, 165 x 200-foot office building at Montgomery and Sutter streets.

SANTA BARBARA.—The Santa Barbara & Suburban Railway Co. plans to erect an 80 x 120-foot car barn, to be fully equipped with all necessary machinery for repair work, contract for construction of which has been awarded the California Unit Brick & Tile Co.

COLORADO

DENVER. — The Peerless Iron & Wire Works has been incorporated; $3,000; by David Baer and J. J. O'Connor.

CONNECTICUT

NEW HAVEN.—The Bavier Mfg. Co., recently incorporated to manufacture hardware and machinery, is having plans prepared for a new factory.

WATERBURY.—The machine shop of the Waterbury Castings Co. was recently damaged by fire. Estimated loss $50,000.

GEORGIA

ATLANTA.—Plans are being prepared by Fairbanks-Morse Co. for an addition estimated to cost about $30,000.

CORDELE.—The city recently opened bids for a new waterworks plant to cost $35,000, work on which will commence at once.

ILLINOIS

CHICAGO.—The Curtis Fixture Co. plans to erect a four-story, 50 x 50-foot concrete addition to its machine shop.

CHICAGO.—The Klipfel Mfg. Co., manufacturer of steam specialties, recently purchased a site and will erect a three-story factory.

CHICAGO.—The National Auto Maintenance Co. recently leased a building which will be equipped as an automobile and engine repair shop.

CHICAGO.—The New York, Chicago & St. Louis railroad plans to erect a one-story brick machine shop estimated to cost about $15,000. A. E. Hawk, architect.

CHICAGO.—The Voightman Metal Sash Co. recently purchased a building and will equip it to accommodate its rapidly increasing business.

CHICAGO.—Holmquist & Co., manufacturers of woodenware products, recently purchased a site and plan to erect a factory estimated to cost about $50,000.

CHICAGO.—The American Metal Weather Strip Co. has been incorporated; $10,000; by D. B. Johnson, J. T. Frellsen, E. R. Goldsmith.

JOLIET.—The Joliet Forge Co. has been incorporated; $80,000; by J. J. Sharpe, H. W. Sharpe, Joliet, and J. A. Holmes, Pierre.

LAWRENCEVILLE.—The Lawrenceville Machine Co. has been incorporated; $20,000; by James David, C. W. Guthrie, R. G. Rogers, A. D. Smith, H. A. Snyder and C. F. Breen.

NORTH CHICAGO.—The Cyclone Fence Co. plans to erect a 126 x 160-foot addition to its plant.

TRENTON.—The Rasch Heating & Ventilating Co. plans an addition, equipment for which is estimated to cost about $10,000.

INDIANA

CAMBRIDGE CITY.—Bertsch & Co., manufacturers of punches, shears, etc., recently increased their preferred stock $10,000 for purchasing additional equipment.

MUNCIE.—The B. T. K. Gear & Engine Co. has been incorporated to manufacture autos and accessories; $100,000; by F. M. Boyer, A. Boyer and J. P. Kandel.

IOWA

SIOUX CITY.—The Perkins Bros. Co. plans to erect a three-story, 75 x 100-foot reinforced concrete building estimated to cost $175,000, contracts for which have been awarded.

KENTUCKY

ASHLAND.—The Selby Shoe Co., Portsmouth, O., has definitely decided to construct a factory here. George D. Selby, general manager.

ASHLAND. — Dr. William Salisbury plans the expenditure of $20,000 in the construction of an ice factory with a daily capacity of 100 tons.

CARLISLE.—R. C. King plans to erect a machine shop and is in the market for necessary equipment.

CLOVERPORT.—The Cloverport Bolt & Machine Co. plans a new plant, including an iron foundry.

LOUISVILLE.—The National Power Co., Birmingham, Ala., plans a factory for the manufacture of power machines estimated to cost about $500,000.

LOUISVILLE.—The Rugby Distilling Co. has begun the construction of a bottling plant. Conveying and bottling machinery will be needed.

LOUISVILLE.—The Louisville Water Co. will readvertise for bids on two 400-horsepower water-tube boilers shortly. The original bids were rejected. Theodore A. Leisen, chief engineer.

LOUISVILLE.—The Falls City Construction Co. will design and build a $400,000 hotel plant for the Grayson Springs Ky., Hotel Co. A light plant, refrigerating system and elevators are among the equipment to be purchased.

MIDDLESBORO.—J. R. Hoe & Co. plan to construct an addition to their foundry and machine shop and will be in the market for machine tools and other equipment.

WINCHESTER.—S. Renaker & Sons will build a refrigerating plant in connection with their new produce warehouse, which is to be built shortly.

Grey Iron Castings

We need contracts to make 20 tons more per day, to reduce the cost of production. Our capacity is 50 tons a day; size from 100 pounds down. Willing to work on a very close margin —get our prices.

THE DUNHAM COMPANY
Mfs. of Agricultural Implements
Berea, Ohio

MAINE

FAIRFIELD.—The Keyes Fibre Co. recently began construction work on a 250 x 700-foot factory building.

OLD TOWN.—The Penobscot Chemical Fiber Works plan to erect a paper and sulphite mill estimated to cost about $1,500,000.

PORTLAND.—The Golly Pneumatic Tool Co. has been incorporated to manufacture tools, machinery and appliances; $375,000; by H. W. Hildreth, H. P. Sweetser, Portland.

MASSACHUSETTS

BRIDGEWATER.—Extensive improvements are being made by the Stanley Steel & Iron Co., Bridgewater, Mass. A gas-burning continuous furnace is to replace the five coal-burning furnaces now in use, the gas being furnished by two gas producers. A hydrant ram is being placed to handle billets from the furnace to the rolls. An economizer will be installed to compensate for loss of heat under the boilers as a result of the change in furnaces. A new stack 125 feet high is being erected and a locomotive crane with magnet and bucket is to be put in service.

ROCKPORT.—The workshop of the Cape Ann Tool Co. was recently damaged by fire. Estimated loss, $20,000.

SPRINGFIELD.—The Standard Oil Co. plans to erect an 80 x 90-foot two-story concrete warehouse estimated to cost $17,000, contracts for which were recently awarded.

SPRINGFIELD.—The Carlos Ruggles Lumber Co. has been incorporated; $100,000; by C. Ruggles, C. B. Martin and M. A. Ruggles, Springfield.

SUFFIELD. — The Coburn Trolley Track Mfg. Co., Holyoke, is having plans prepared for a 97 x 187-foot factory here.

MICHIGAN

ALPHA.—The Judson Mining Co. plans to erect a 28 x 83-foot machine shop. E. J. Pierce, manager.

DETROIT.—The W. J. Burton Co., manufacturer of metal building materials, recently purchased a site and plans to erect a $30,000 factory.

DETROIT. — The Wagenthals Motor Co. recently increased its capital from $100,000 to $500,000, and plans to equip a new and larger factory.

FLINT.—The General Motors Co. plans to establish a branch factory at Owosso, Mich.

KALAMAZOO.—The Clarage Foundry Co. plans an addition estimated to cost about $50,000.

SAGINAW.—The Schust Baking Co. plans to construct a $75,000 addition.

MISSOURI

ST. LOUIS.—The Safety Valve & Appliance Co. has been incorporated to manufacture fire safety appliances; $2,000; by J. F. Tracy, F. W. Brand and T. J. Sheehan

MONTANA

DEER LODGE.—President A. J. Earling, of C. M. & St. P. R. R. says work of electrification of road will begin at once. Track between Deer Lodge and Three Forks, Mont., will be finished in a year.

DILLON.—The Beaverhead Elevator Co. will erect a 50,000 bushel capacity grain elevator here.

KALISPEL.—The people have voted $175,000 in bonds to take over and make improvements on plant and system of Northern Idaho & Montana Power Co.

MISSOULA. — O. E. Peppard has been awarded contract for building steel bridge across Big Blackfoot river at $9,590.

POLSON.—The government will build a hydro-electric power plant on Flathead lake near here.

NEW HAMPSHIRE

ROCHESTER.—The box factory of the Chapman Lumber Co. was recently damaged by fire. Estimated loss $100,000.

NEW JERSEY

EGG HARBOR CITY.—The Block Go-Cart Co., Philadelphia, plans to erect a group of buildings here, including a one-story, 72 x 300-foot willow-working shop, 40 x 72-foot power house, 60 x 70-foot paint shop and warehouse.

ELIZABETH.—The Diehl Mfg. Co. plans to erect a power plant, contracts for which were recently awarded, the contract for the steel work going to the Pittsburgh Iron Co., Rochester, Pa., and for the concrete work to the Turner Construction Co., Philadelphia.

NEWARK.—J. Wiss & Sons Co., manufacturer of shears, recently completed plans for a four-story, 50 x 76-foot brick addition.

PERTH AMBOY.—The Roessler & Hasslacher Chemical Co., manufacturer of chemicals, plans to erect a three-story, fireproof, 50 x 100-foot addition, estimated to cost $30,000.

PLAINFIELD.—The Vitaphone Co. plans a 45 x 185-foot addition.

NEW YORK

BUFFALO.—The Globe Elevator Works plans to erect an addition to its shops here.

BUFFALO.—The Buffalo Copper Rolling Mill recently completed plans for an addition to its acid building.

BUFFALO. — The General Chemical Co. plans to erect a fireproof extension to its ore crushing plant on Abbott road.

BUFFALO.—The Iroquois Bag Co. recently completed plans for a two-story brick factory to be equipped for the manufacture of bags. Estimated cost $15,000.

BUFFALO.—The Husted Milling Co. is preparing plans for a reinforced concrete, fireproof feed-mill and elevator to replace the plant recently damaged by fire.

BUFFALO.—The Universal Calculator Co., Inc., has been incorporated; machinery devices; $35,000; by H. A. Beals, C. J. Peters and G. L. Reichart, Buffalo.

BUFFALO.—The Lockhart-Hodge Co. has been incorporated; safety devices for saws; $50,000; by C. A. Lockart, H. L. Hodge and S. Hodge. The new company will take over the business of the Nye Co.

FRANKFORT. — The Adriance Machine Works, Inc., has been incorporated to manufacture machinery, tools and hardware; $200,000; by Benj. Adriance, Brooklyn and Chas. T. Titus and R. L. Kinne, Utica.

KILL BUCK.—The plant of the Buck Plating Co. was recently damaged by fire. Estimated loss $30,000.

MANHATTAN.—The Fulton Bag & Cotton Mills plan to erect an eight-story factory and a 76-story warehouse. Estimated cost $300,000.

MANHATTAN.—The Phelps Motor Car Corporation has been incorporated; machinery; $50,000; by F. F. Sanford, E. P. Craw and H. A. Biggs, 220 West Ninety-eighth street. New York City.

NEW YORK CITY.—The plant of the Premier Metal Etching Co. was recently damaged by fire. Estimated loss $20,000.

NEW YORK CITY.—The United States Metal Cap & Steel Co. has been incorporated to manufacture bottlers' supplies; $5,000,000; by H. E. Latter, W. J. Maloney and O. J. Reichard, Wilmington, Del.

NEW YORK CITY.—The Pompton Steel & Iron Corporation has been incorporated to deal in iron, steel, metals and minerals; $50,000; by L. Cogswell, Parker Corning and E. Corning, Albany. The new concern will maintain a large warehouse and salesroom in New York City.

NIAGARA FALLS.—The Union Carbide Co. is erecting five buildings estimated to cost about $750,000.

POUGHKEEPSIE.—The Warm Hand Steering Wheel Corporation has been incorporated; steering wheels; $150,000; by G. E. Smith, W. S. Barton and J. C. Barton, 1324 Seventy-third street, Brooklyn, N. Y.

SYRACUSE.—The Morrow Mfg. Co. plans to erect a 34 x 100-foot three-story machine shop. Merrick & Randall, architects.

TROY.—The sash and blind factory of Charles Duncan was recently damaged by fire. Estimated loss $25 000.

VICTOR.—The Lock Insulator Co. is erecting a 72 x 160-foot addition to its plant in this city.

NORTH CAROLINA

GASTONIA.—The Coker Machine & Foundry Co. plans to establish a factory here for the manufacture of cotton mill machinery of all kinds. George R. Spencer is president and J. Robert Craig, secretary and treasurer.

OHIO

ASHLAND.—F. E. Myers & Bro., manufacturer of pumps, recently awarded contracts for a 60 x 160-foot, four-story addition.

CINCINNATI.—Estimates are being received for steel other than structural for the 12-story Gwynne office building, Sixth and Main streets. Architect Ernest Flagg, New York City, is in charge.

CINCINNATI.—George A. Hattersley, Norwood, a suburb, is one of the incorporators of the Reliable Safe & Lock Co., Covington, Ky. The capital is $50,000, and the company will manufacture and deal in safes, vaults and locks.

CINCINNATI. — The Cincinnati Precision Lathe Co., Mt. Washington, Cincinnati, O., advises that it has recently increased its capital stock from $50,000 to $75,000, and that it will enlarge its plant and add some new equipment.

CINCINNATI.—The Gedge-Gray Co. advises that all recent reports that it is building a new factory in Lockland, O., a suburb of Cincinnati, are incorrect. The company states that it has not as yet let the contract for a new building, and that it does not contemplate doing so for some time.

CINCINNATI.—The Modern Machine Tool Co., Winton Place, Cincinnati, advises that its recent increase in capital stock was for the purpose of increasing working facilities, and to secure more working capital. The company will not be in the market for new equipment immediately, but will install some lathes of its own make.

CINCINNATI.—A one story building of steel, iron and concrete, will be erected at the northeast corner of Ludlow and Front streets, Cincinnati, by the Adams Express Co. Architect David Davis of Cincinnati, is in charge of the building, the contract for the erection of which has been let to Ben Evans, also of that city.

CINCINNATI.—Bids will be asked for about Jan. 1 for the heating, ventilating, lighting and power plants for the new Hamilton county court house, the construction of which will be begun soon. It is estimated the above equipment will aggregate $300,000. The court house proper will cost several million dollars. Bert Baldwin & Co., Cincinnati, have been appointed to design and superintend installation of the mechanical equipment.

CINCINNATI.—The Cincinnati branch of the Crucible Steel Co., of America, advises that the new building that it is having erected on Third street, Cincinnati, is about completed, and will be occupied within a short time. The building is of concrete, brick and steel, and will be used for warehouse and office purposes. It is one story in height, with the exception of the office section, which will be two stories.

CINCINNATI. — Considerable power plant and electric generating equipment will be needed in the new generating plant of the Columbia Gas & Electric Co., Cincinnati which is soon to be erected on Front street, between John and Smith streets, that city. It is understood that contracts are about to be let for this work through Sargeant & Lundy, of Chicago, the engineers in charge. The dimensions of the building will be 220 x 270 feet, and the cost will be approximately $500,000.

CLEVELAND.—The Lake Erie Forging Co. plans to erect a 50 x 50-foot addition at its plant.

CLEVELAND.—The White Automobile Co. recently secured a permit for a one-story, 30 x 240-foot shop addition estimated to cost about $10,000.

CLEVELAND.—The W. & F. Felberth Bros. Co. recently began construction work on its 88 x 122-foot one-story brick machine shop. Estimated cost $6,000.

CLEVELAND.—The Ohio Foundry Co. recently broke ground for a two-story mill-construction addition estimated to cost about $10,000, to be used for assembling.

CLEVELAND. — The Otis Steel Co. will install 31 new motors ranging from 12 horsepower to 80 horsepower, all of which have been ordered from the General Electric Co.

CLEVELAND.—The Cuyahoga Boiler Works has been incorporated; $36,000; by J. Maher Sr., John M. Mahr, W. H. Botten, H. W. Botten and E. M. Fledner.

CLEVELAND. — The Collinwood Foundry Co. has been incorporated; $10,000; by Joseph Horn, J. Lane, F. Born, K. Tajerk and Frank Vainer.

CLEVELAND.—The American Steel & Wire Co., Cleveland, will install additional 400 horsepower and 600 horsepower motors recently ordered from the General Electric Co.

DAYTON.—The contract for building the superstructure of the Boomershine bridge near Farmersville, has been let to the Central States Bridge Co., Indianapolis, at $16,490.

EAST LIVERPOOL.—The National Drawn Steel Co., manufacturer drawn steel products, including automobile appliances, gas engines, cash registers, typewriters, steam engines, etc., will be in operation in this city within three months. The company is capitalized at $100,000. Cornelius Cronin, president of the company, and John Palmer, vice president, are both of this city.

HAMILTON.—Engineer L. A. Dillon has commenced the preparation of specifications for the new bridge on Main and High streets. The east abutment is to extend 55 feet further than the present bridge, and the west abutment 100 feet further west than at present.

IRONTON.—The Ohio Valley Electric Railway Co. plans to erect a $20 000 car barn here. W. W. Magoon, Huntington, W. Va., general manager.

KENT.—The Standish Chain & Mfg. Co., which recently increased its capital from $18,000 to $50,000, plans to erect a new plant with automatic machines.

LORAIN.—The National Tube Co. plans extensive additions to its local plant, including an additional blooming mill and a new open-hearth plant.

SPRINGFIELD.—The city plans a 31 x 83-foot brick one and two-story foundry and forge shop estimated to cost about $7,500.

TOLEDO.—The Champion Spark Plug Co. is erecting a 40 x 120-foot four-story concrete factory building.

TOLEDO.—The Machinery Mfg. Co., of Toledo, has been incorporated; $25,000; by John M. Ormond, F. B. Bolm, N. O. Winter and A. M. Amberg.

WEST PARK.—Bids will be received until Oct. 18 for a two-story, 50 x 70-foot city hall estimated to cost about $25,000. Address F. Feuchter, village clerk.

YOUNGSTOWN.—The Republic Iron & Steel Co., Youngstown, will add to its electric drive equipment thirteen motors ranging from 10 horsepower to 350 horsepower and control panels, which have been purchased from the General Electric Co.

OKLAHOMA

BOKHOMA.—The Wilson Lumber Co. plans to erect a $100,000 plant to replace the mills recently damaged by fire.

TULSA.—The Tulsa Foundry & Mfg. Co. has been incorporated; $5,000; by H. L. Eastman, I. V. Gray and R. W. Page, Tulsa.

OREGON

BAKER.—The city commission has authorized the appointment of an engineer to estimate the cost of replacing 17,000 feet of wooden pipe with steel pipe.

COTTAGE GROVE.—A. C. U. Berry, successful bidder for steel bridge over Coast Fork on Main street, has refused to sign contract because of change in specifications. Bids will probably be readvertised.

KLAMATH FALLS. — The Pringle Falls

Woodmansee & Davidson, Inc.
ENGINEERS
All Kinds of Power Plants
SPECIALISTS in the Industrial Application of PRODUCER GAS
MILWAUKEE Wells Bldg. CHICAGO 1st National Bank

We make a specialty of
ABRASION IRON
A so-called *"Hard Iron" or "Semi Steel"* for castings that are subjected to severe wear, such as mill grinding rings, crusher jaws, roller wheels, etc.
Our mixture gives a very tough, long wearing iron, characterized by exceptional molecular continuity.
Write for prices.
The O. S. KELLY COMPANY
Springfield, Ohio

Electric Power & Water Co. will develop hydro-electric plant six miles from here. President M. C. Donahue is superintending preliminary surveys.

OREGON CITY.—The council is conducting an investigation into the feasibility of bringing water from Clackamas river. Estimated cost $150,000.

PORTLAND.—The people will vote on $1,250,000 in bonds for Multnomah county's share in steel bridge across Columbia river to Vancouver, Wash.

PENNSYLVANIA

ALIQUIPPA. — Creditors have started a movement to reorganize the Kidd Bros. & Burgher Co., manufacturer of cold drawn steel products which has been in the hands of Receiver T. W. Friend for the last three and a half years. The plant has continued operations under the receivership.

BANGOR.—The S. Chory Mfg. Co., manufacturer of hoisting engines, whose plant was recently damaged by fire, has erected temporary buildings, and plans are now being prepared for a new plant.

BEAVER FALLS. — The Union Drawn Steel Co. is erecting an addition, 50 x 125 feet, which will contain a new furnace and pickling rooms. Automatic stokers are being installed in the plant at the lower end of the city.

BRADDOCK.—The board of education recently purchased a site, upon which it plans to erect a 116 x 120-foot, two and three-story high school building estimated to cost about $150,000.

BUTLER.—The Forged Steel Wheel Co. will place in operation two 500-kilowatt, two-unit, three-bearing motor-generator sets, four 200 kilovolt-amperes and four 750 kilovolt-amperes, transformers and a switchboard which will be furnished by the General Electric Co.

ERIE.—The Erie Bolt & Nut Co. has been organized with a capital stock of $100,000. Lincoln Davis, Providence, R. I., A. Chandler, Julian Burdick, E. S. Roach and A. W. Mitchell are interested.

GREENSBURG. — The Barnes Safe & Lock Co. plans to erect a 60 x 240-foot shop, a 40 x 40-foot filing room and a 40 x 40-foot carpenter shop.

JOHNSTOWN.—Reports that the Cambria Steel Co. has been buying land near New Florence, Pa., are officially denied.

NORRISTOWN.—The Holston Mfg. Co. advises it is erecting a plant which with equipment will cost about $100,000. Operations are expected to be started in January.

PHILADELPHIA.—Henry A. Drew, Inc., plans to erect a six-story reinforced concrete warehouse at 719 Sansome street, plans for which are now being prepared.

PITTSBURGH.—The Union railroad is in the market for a combination punch and shear with a gap of 66 inches, with overhead motor drive, for installation in the shops at Fort Perry, Pa.

PITTSBURGH.—Work on the new $700,000 freight station of the Pennsylvania Railroad Co., on the North Side, is progressing rapidly. The building, 40 x 500 feet, will be of brick and steel construction.

PITTSBURGH.—The Pennsylvania railroad is inquiring for a small list of tools, including a bending roll and a shaper, for installation in the shops on Twenty-eighth street, and two finishing machines for use in the South Side shops, this city.

PITTSBURGH. — The Lockhart Mfg. Co. has taken out a charter at Dover, Del., with a capital stock of $13,000, to manufacture, sell and deal in agricultural implements and tools of all kinds used in the crafts and arts. John McC. Lockhart, Coraopolis, Pa., and Hugh D. Wallace and A. M. Lockhart, both of Pittsburgh, are named as incorporaters.

POTTSTOWN.—The Ellis Keystone Agricultural Works recently increased its capital stock from $100,000 to $200,000. The company advises that this step is to provide increased capital for its growing business and no changes of public interest are contemplated.

SHARON.—The Sharon Foundry Co. has awarded Wallis & Carley a contract for rebuilding three brick, and steel foundry buildings.

SOUTH BETHLEHEM.—The Bethlehem Steel Co., will add to the electric drive equipment of its mills thirty-one motors ranging from 2 horsepower to 10 horsepower and has ordered them from the General Electric Co.

RHODE ISLAND

PAWTUCKET.—The What Cheer Chemical Co. plans to erect a three-story brick plant including a power house and boiler room.

TENNESSEE

NASHVILLE. — The Chester Motor Car Co. is building a garage and will need machine tools for its large repair shop.

TEXAS

DALLAS.—The Dallas Street Railway Co. plans car barns estimated to cost $125,000. E. T. Moore, general manager.

DALLAS.—The Standard-Tilton Milling Co. recently awarded contracts for its proposed flour mill, grain elevator, power house, warehouse and storage building. Estimated cost $300,000.

RUNGE.—The city plans to install a municipal electric light plant estimated to cost about $20,000.

TEXARKANA.—The Southern Motor Co. plans to erect a $12,000 plant for the manufacture of motors.

UTAH

OGDEN.—The Intermountain Mausoleum Co. plans to erect a 64 x 124-foot reinforced concrete, stone and marble mausoleum estimated to cost $45,000.

WASHINGTON

ABERDEEN. — The council has awarded the contract for a large supply of steel pipe for water system to the Crane Co., Chicago.

BELLINGHAM.—Plans for the irrigation of several hundred acres near Custer have been approved by County Engineer C. M. Adams.

CLARKSTON.—The chamber of commerce is considering proposition made by J. Stucky to build a mill and equip it with Tom Thumb type of machinery.

EDMONDS.—The contract for the plant of the Pacific Ramie Co., Arcade building, Seattle, to be built here, has been awarded to Walter White & Walker, Crary building, Seattle, for approximately $150,000.

HOQUIAM. — The Niagara Falls Ladder Co. will build an extensive addition to its present factory. New machinery will be purchased.

MONTESANO.—A logging road to connect with the Northern Pacific main line will be built by Shafer Bros.

SEATTLE.—L. J. Colman, Colman building, plans to erect a steel and concrete building at 116 Jackson street.

SEATTLE.—The Sears Roebuck Co. plans to erect a 10-story reinforced concrete addition estimated to cost about $1,000,000. G. C. Nimmons, Chicago, architect.

SEATTLE.—W. D. Perkins, Alaska building, plans to erect a six-story steel and concrete building estimated to cost about $175,000.

SEATTLE. — The Puget Sound Traction Light & Power Co. has purchased a power site on Baker river and will develop it at once.

SEATTLE.—The council has passed ordinances for a large sewer improvement in West Seattle and for water main improvement in the North End.

SEATTLE.—Four large steel bridges have been decided upon by the city council as crossings for the new Lake Washington canal. A bond issue will be put up to the voters in March. Total cost $1,800,000.

SEATTLE.—The Pacific Coast Steamship Co. will make $30,000 worth of repairs on Steamer City of Seattle. Improvements will consist of new boilers, fuel burning system, etc.

SEATTLE.—Plans have been completed by Carl Siebrand, Arcade building, for a 4-story steel and concrete addition to the plant of the Seattle Brewing & Malting Co., Georgetown.

SEATTLE. — The proposition of voting bonds for a $410,000 bridge on Sixth avenue N. E.; a $420,000 bridge on Fremont avenue; a $460,000 bridge on Fifteenth avenue N. W. and a $650,000 bridge on Spokane avenue, will be placed before the voters in March.

SEATTLE.—The American Electric Changemaker Co. has been incorporated to manufacture change-making machines; $100,000; by G. W. Hoffman, president; A. A. Liegen, vice president and H. Rohwer, secretary and treasurer. The company plans to erect a plant here soon.

SPOKANE.—The Union Iron Works has awarded contract for new factory building to Hurley Hason Co. Machinery contract not awarded.

STARTUP.—The mill of the Wallace Lumber Co. has been destroyed by fire, with a loss of $60,000. Insurance $30,000.

TACOMA.—Henry Hewitt Jr., of Tacoma, has gone to New York and London to finance $5 000,000 steel plant for this city and Vancouver, B. C.

TACOMA.—The plant of the Griffin Wheel Works, South Tacoma, will be doubled in capacity and a plant to cost $1,000,000 will be built in Los Angeles, Cal.

WALLA WALLA.—The county commissioners have approved plans for $300,000 court house and jail, and have ordered construction work. Bids will be taken. Henry Osterman, architect.

WISCONSIN

GRAND RAPIDS.—The Jacobson & Ackerman Co., architects and engineers, Grand Rapids, Wis., were awarded the general contract for the construction of a hydro-electric plant for the Rock River Power Co., at Sterling, Ill. The dam has been completed and the Jacobson-Ackerman contract calls for power house, six 10,4-foot water wheels, draughts for flumes, and transmission lines.

KENOSHA.—The Wisconsin Gas & Electric Co. has awarded a contract to the Wisconsin Bridge & Iron Co., of Milwaukee, for a new steel bridge over Pike river at Ashland avenue, Kenosha. The amount of the contract is $8,200.

MADISON.—The Monona Building Co., capital $100,000, has been organized by Sanford P. Starks, Charles M. Dow and Frank D. Reed all of Madison, to build a large business and light manufacturing block on East Washington avenue.

MANITOWOC.—The common council has adopted the recommendation of Mayor Henry Stolze that the cost of lengthening and rebuilding the Eighth street drawbridge be determined by a call for bids before it proceeds with the original plan to appropriate $70,000 for the construction of a modern bascule bridge. The cost of rebuilding it is stated, will not exceed $30,000. Bids will be called for at once for the rebuilding work. L. K. Pitz is city engineer.

MARSHFIELD. — The Augustin Rotary Valve Engine Co. has been incorporated to manufacture valves and engine parts, etc.; $10,000; by R. J. Strause, C. B. Harrington and H. F. Hoerl, Marshfield.

MENOMONEE FALLS.—J. A. Pratt and W. C. Leitch have purchased the properties of

$6,000,000 a Year For Eyes

75% of that expense is unnecessary. And actually paid up claims do not represent the entire expense connected with "lost sight" accidents. Lawyers' fees—court charges—the effect of each accident on shop morals, and slowed up production all contribute to *your* loss.

Certain large Steel Companies—shops and railroads, realizing that an ounce of prevention is worth a pound of cure—have made it *compulsory* for every workman on jobs where there is an "eye risk" to wear goggles.

Saniglas KING'S SAFETY GOGGLE

These goggles—made of the finest imported flat optical glass—won't shatter or break under an ordinary blow and allow a clear and undisturbed vision of the work at all times. Mounted on light white metal frames they eliminate the discomforts of the usual goggle without any sacrifice of strength and durability.

Why not send for a sample to try out in your own plant—in one firm alone, whose "lost sight" cases averaged 48 per month—*not one case* was reported after the introduction of Saniglas Goggles. Think of the time—money and annoyance they saved; and may save you.

Julius King Optical Co.

CHICAGO, ILL. 5-7-9 W. Madison St.

NEW YORK 12 Maiden Lane

the Menomonee Falls Electric Light & Power Co. and are planning to rebuild the plant, add new equipment and double the output of current for commercial purposes.

MENOMONEE FALLS.—The Nelson Co.'s foundry has been placed in operation and is employing about 40 men.

MILWAUKEE.—The plant of the Gross Coal Co. was recently damaged by fire. Estimated loss $75,000.

MILWAUKEE.—The Ticonic Investment Co. plans to erect a six-story, 90 x 120-foot brick and reinforced concrete factory. Estimated cost $200,000.

MILWAUKEE.—A freight house, dock and passenger terminal costing $125,000 will be constructed by the Chicago, Racine & Milwaukee Steamship Line at Milwaukee, work to commence about Feb. 1.

MILWAUKEE.—The Milwaukee county board of supervisors has finally adopted the plans prepared by Leenhouts & Guthrie, architects, Miller block, Milwaukee, for the proposed new house of correction group at North Milwaukee, calling for an expenditure of $497,841. Bids will be called for soon.

MONROE.—The common council is considering the construction of a new standpipe and reservoir for the municipal waterworks plant to replace the present tank, holding 150,000 gallons, which is dilapidated and of inadequate capacity.

RACINE.—The common council is preparing to establish a complete repair shop by rebuilding No. 5 fire station and installing the necessary equipment of tools, which will be driven by individual motors. W. S. Goodland is mayor.

WAUPUN.—The C. A. Shaler Co., manufacturing electric and steam vulcanizing apparatus and electrical appliances of all kinds, has broken ground for a 3-story addition, which will double its productive capacity. Equipment for the addition has not been purchased.

DOMINION OF CANADA

ALBERTA

CALGARY.—The Consolidated Rubber Co. recently awarded contracts for its five-story reinforced concrete warehouse estimated to cost about $100,000. Canadian Stewart Co., Montreal, contractor.

BRITISH COLUMBIA

NELSON.—The Steelite Explosives Co. plans to erect a powder factory estimated to cost about $35,000, contracts for which were recently awarded.

VANCOUVER.—Twenty locomotives on the Canadian Pacific railway subdivision between North Bend and Vancouver have been transformed into oil burners. The remaining 20 will also be converted.

VICTORIA.—Tenders will be called in two months for a new hospital to cost $399,840. Loring P. Rixford, San Francisco, architect.

MANITOBA

BRANDON.—The Brandon Machine & Implement Works has been given the contract for the steel work on the new street car barns at $12 per ton.

WINNIPEG.—The John Dolman Co., Winnipeg, has been awarded a contract for installing boilers in the new civic power plant at $5,700.

WINNIPEG.—The ratepayers having endorsed the $13,500,000 expenditure on the procuring of a water supply from Shoal Lake, work will be commenced at once. Many miles of cast iron pipe will be required.

ONTARIO

CHATHAM.—The National Forging Co. has taken over the plant formerly occupied by the Swift Motor Car Co., and will manufacture auto and carriage forgings and sockets of different kinds, employing about 50 men at present.

GANANOQUE.—The plant of the Gananoque Spring & Axle Works was recently damaged by fire. Estimated loss, $40,000.

GODERICH.—The American Road Machinery Co. plans to erect a 70 x 100-foot addition to its factory here.

HAMILTON.—The Berkel-Freeman Slicing Machine Co., Ltd., has been incorporated to manufacture slicing machines;$40,000; by Stanley S. Mills, William Bain, John J. Dashwood, et al.

OTTAWA.—Tenders will be received until Oct. 29 by R. C. Desrochers, secretary of the public works department, for a breakwater at Kincardine; harbor improvements at Wellington; constructing an extension to the wharf and dredging at Chocolate Cove. N. B., and for harbor improvements at Thornbury, Grey county, Ont. Tenders will be received until Oct. 28 for wharf improvements at St. Jean Port Joli, Que.

OTTAWA.—The piping of water from Lake Pemichangan, a distance of 50 miles, to the city, the pipes to be carried across the Ottawa river by a steel bridge, is proposed in the report of Houston & Binnie, British engineers, in connection with the question of a water supply for Ottawa. The Gatineau river will also be bridged and a huge reservoir built at Chelsea. Estimated cost $8,000,000.

OTTAWA.—Thirty million dollars' worth of harbor improvements, necessitating a considerable demand for steel, are now under way in Canada. The total outlay will be about $10,000,000 per year, the works being mainly at St. John, Que., Montreal, Toronto, Hamilton, Vancouver and Victoria. The Halifax terminals are being built by the Railways and Canals department.

RIDEAU JUNCTION.—The Canadian Northern railway recently began work on its new shops here, with a view to completing them by next spring. The shops will give employment to from 200 to 300 men.

TORONTO.—The John Inglis Co., machinery manufacturer, will erect a one-story brick, concrete and steel boiler shop containing 24,000 square feet floor space. Estimated cost about $100,000.

TORONTO.—The Canadian Automatic Parcel & Checking Co., Ltd., has been incorporated to manufacture lockers, safety deposit boxes, vaults, etc; $200,000; by Miner H. Ballou, John J. Williams, Milton C. Phillips, et al.

TORONTO.—The Canadian General Electric Co. recently received a contract from the Abitibi Pulp & Paper Co. for electric motors from 400 horsepower downwards for the company's new mills at Iroquois Falls, Que., and a contract from the Donnaconna Paper Co. for electric motors aggregating 1,330 horsepower. The Hydro-Electric Power Commission of Ontario awarded this company a contract for six transformers, each 3,500 kilowatts.

QUEBEC

MONTREAL.—The Steel Co. of Canada recently awarded contracts for its proposed nail factory here.

MONTREAL.—New branch lines in the west aggregating almost 800 miles will be built by the Canadian Pacific railway, the project having been ratified at the annual meeting held recently.

MONTREAL.—The John S. Metcalf Co., Ltd., has been awarded a contract by the Canadian Pacific railway for the extension of the Glen Arch at Westmount, Que., at $50,000. The extension will provide for four tracks.

MONTREAL.—The Electric Mfg. Co. of Canada, Ltd., has been incorporated to manufacture and deal in electrical plant and machinery, act as electrical and mechanical engineers, etc.; $2,000,000; by Howard Salter Ross, Eugene Real Angers and Oswald F. Shearer, all of Montreal.

MONTREAL.—A feat of bridgework recently performed by the Dominion Bridge Co. was the placing of a steel bridge, made-to-order and weighing 2,600,000 pounds, across a gap of 270 feet, the operation taking one hour and 25 minutes. This was the third span of the Lachine bridge across the St. Lawrence, which is being built for the Canadian Pacific railway.

VANCOUVER.—An electrically-driven pumping plant will be installed by the Canadian Collieries, Ltd. It will be of four separate units, two of them to be driven by 75 horsepower motors; another by a 75 horsepower motor. These three units will be capable of delivering 350 gallons per minute against a 370-foot head, while the fourth will deliver 350 gallons against a 740-foot head. The Canadian Allis-Chalmers, Ltd., will supply the pumps and the Canadian General Electric Co., the motors.

SASKATCHEWAN

ESTEVAN.—The ratepayers have approved by-laws for street lighting, extensions to power plant and light service and for sewer expansion at a cost of $36,000, and work will begin immediately.

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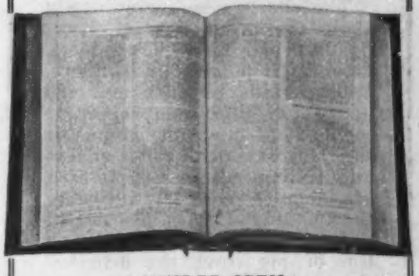

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CLEVELAND - OHIO

The

Rolling Mill Industry

By F. H. KINDL, Engineer

A Condensed, General Description of Iron and Steel Rolling Mills and Their Products.

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In this work the author has endeavored to give a condensed, general description of iron and steel rolling mills and their products, without discussing the details of rolling any special material. Essentially, it is a summary of American rolling mill practice, its development being traced from the beginning to the present day.

An effort has been made to define more closely the various mills and their products and the various classifications herein presented have been approved by leading manufacturers and many of the country's foremost iron and steel engineers.

The charts which graphically show the production of semi-finished and finished products, from 2,000 pounds of iron ore, 1,000 pounds of coke and 600 pounds of limestone represent modern practice at some of the largest open-hearth plants and rolling mills. Charts also are included to clearly illustrate the amounts of material charged and produced in making one ton of pig iron; the distribution and production of iron and steel in 1907 and 1911; the conversion of pig iron into the various finished products, etc.

For those interested in the economics of the iron industry, a table has been prepared in which a comparison has been made of the general fundamental factors dictating the production of pig iron in the United States, Germany and Great Britain, with particular reference to the Pittsburgh district of the United States, the Rheinland-Westfalia district of Germany, and the Cleveland district of Great Britain.

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TRADE CATALOGS

BOILER TUBES.—An eight-page bulletin, issued recently by the National Tube Co., Pittsburgh, is devoted to tests of stationary and marine boiler tubes. The tests illustrated and described include expanding, crushing, flattening, rolling, beading, etc.

ELECTRIC DRILLS. — In two bulletins recently issued by the Standard Electric Tool Co., Cincinnati, direct-current and two and three-phase, alternating current, portable electric drills are illustrated and described. Both of these bulletins supersede similar publications issued by the Standard company.

ELECTRIC CRANES.—Three bulletins recently have been issued by the Shaw Electric Crane Co., affiliated with Manning, Maxwell & Moore, Inc., New York, which describe portable electric drag, single drum cranes, direct current crane motors and an electric crane for steel mill service.

HEAT TREATING FURNACES. — The Garrett-Tilley Co., 90 West street, New York City, has issued a bulletin describing its line of over-fired heat-treating furnaces of the car type. They may be operated with either natural, water or producer gas or oil as fuel. A large number of installations are illustrated and described.

EYE PROTECTORS. — A 28-page booklet published by T. A. Willson & Co., Inc., Reading, Pa., is devoted to eye protectors for industrial use. The safety glasses manufactured by this company are illustrated and described in detail and numerous suggestions are made covering the protection of eyes of workmen in industrial service.

MECHANICAL LEATHER GOODS.—An 88-page catalog issued by the Chicago Rawhide Mfg. Co., Chicago, is devoted to the extensive line of mechanical leather goods manufactured by this company, including belting, lacing, straps, packings, frictions, gears, etc. Numerous illustrations are included showing views of this company's plant.

INDUSTRIAL OZONATORS. — An eight-page bulletin recently issued by the Sprague Electric Works, of the General Electric Co., New York City, is devoted to industrial ozonators, which are adapted for ventilation and air and water purification and also can be used in a number of manufacturing processes.

CORE OVENS.—In a four-page circular, issued by the Quigley Furnace & Foundry Co., Springfield, Mass., the continuous revolving shelf or reel type core oven is illustrated and described. This oven is adapted for the use of coal, coke, oil or gas as fuel. The oven is of the sectional type and any number of units can be installed to meet the requirements of a foundry.

HOISTS.—In a 16-page bulletin recently issued by the Pawling & Harnischfeger Co., Milwaukee, a new motor-driven hoist for I-beam operation is illustrated and described. This hoist is made in different types for hook suspension, with truck operated by a hand chain wheel, with motor-driven truck and floor-operated controllers and with motor-driven truck controlled from a traveling, open or enclosed type cage.

HAND DRILLS AND PORTABLE COMPRESSORS.—In a 16-page bulletin, issued by the Chicago Pneumatic Tool Co., Chicago, hand drills and portable air compressors are illustrated and described. The portable compressor is gasoline engine-driven and the entire outfit is mounted on a four-wheel truck to facilitate its transportation. A semi-portable gasoline engine-driven air compressor mounted on skids also is shown.

PNEUMATIC HAMMERS AND RIVETERS.—An eight-page bulletin, issued by the Ingersoll-Rand Co., New York City, is devoted to a new line of riveting hammers suitable for structural, tank or any other similar work requiring rivets up to 1¼ inches in diameter. A well-illustrated booklet, also issued by this company, is devoted to a core drill suitable for coring in mining operations, prospecting, etc.

TOOLS.—The new catalog issued by the L. S. Starrett Co., Athol, Mass., contains a great deal of valuable data for reference, including metric conversion tables, decimal equivalents, weight computations, tapers and angles, wire gages, etc. Additions to the Starrett line include several special micrometers, calipers, squares, straight edges and gages, also a variety of hack saws. The catalog contains 320 pages.

PIPE FITTINGS.—In a handsomely illustrated 48-page catalog, issued by the National Tube Co., Pittsburgh, the pipe specialties manufactured at the works of this company, located at Kewanee, Ill., are illustrated and described. These include Kewanee unions of various types, boiler fittings, etc. The method of testing unions is described and unions are shown which have been disconnected 1,000 times and are still in good condition for future service.

RIVETERS.—An eight-page bulletin, issued by the Ingersoll-Rand Co., New York City, is devoted to riveting hammers. This tool is short so that it may be operated in close quarters and is light in weight and free from vibration. The handle is a drop forging of liberal size and is of such a shape that it is easy to grasp. The cylinder is drop-forged and sand blast finished, a coat of lacquer preventing rust.

GALVANIZING PROCESS. — The Metal Treatment & Equipment Co., Inc., 1784 Broadway, New York City, has issued a booklet entitled "Protection of Iron and Steel Against Corrosion," which outlines the chemical action of corrosion and the methods for its prevention. The galvanizing process devised by this company is described in detail. One chapter of the booklet points out a method for estimating required galvanizing equipment to insure the greatest economy.

FOUNDRY EQUIPMENT AND SUPPLIES.—In a comprehensive 176-page catalog, the Central Foundry Supply Co., Columbus, illustrates and describes its extensive line of equipment and supplies for iron, steel, malleable and brass foundry use. Practically every machine necessary to equip the modern shop is shown from the cupola to the casting department and the line of supplies includes everything from chaplets to molders' tools, etc. The catalog concludes with an index which will facilitate reference to the various lines included in this work.

SEAMLESS STEEL TUBING.—A 40-page bulletin, issued by the National Tube Co., Pittsburgh, contains extracts from an address to the United States naval school of marine engineering, presented by J. H. Nicholson and Emil Holinger. The manufacture and use of Shelby seamless steel tubing is discussed at length and the application of tubular sections to machine design should prove of interest to engineers generally. A large number of illustrations covering the various operations of the seamless tube process also are included.